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Original Communications.

*THE CUMULATIVE ACTION OF DIGITALIS.**

BY H. A. HARE, M.D.,
Professor of Therapeutics in the Jefferson Medical College of Philadelphia.

The most important point in beginning this article is to consider what is meant by the term "cumulative action of digitalis." By this term I mean the more or less sudden development of an irregular action of the heart in a person who has taken large and repeated doses of digitalis, with a corresponding irregular, hobbling pulse and, if the effects are severe, vomiting, feebleness, and a sensation of cardiac distress as additional symptoms. These symptoms may come on while the patient is lying still, but are more frequently initiated by the patient sitting upright or moving in such a way as to increase the work of the heart and vaso-motor system. When bodily quiet has been maintained by rest in bed for some days or hours the onset is usually sudden, but when the patient has kept on his feet the symptoms may come on more gradually. These symptoms are apparently due to the fact that the drug is given in such amounts and so frequently that it accumulates in the body; or if the drug

*A paper read before the Association of American Physicians at the Congress of Physicians and Surgeons, Washington, May, 1897.

itself does not accumulate its effects accumulate, so that before the effect produced by one dose has passed by the effect of another is superimposed upon it. In the belief that digitalis has this cumulative effect the writer of course does not stand alone, for nearly all authors speak of it, and many of the profession believe in the possibility of its occurrence even if they have not met with it. Thus, Soullier (*Traite de Thérapeutique et de Pharm.*, Paris, 1895) says that digitalis is one of those drugs which possess the curious phenomena of accumulative effect, which necessitates the suspension of the remedy for eight days after it has been given eight days, and quotes Lepine as never using it on consecutive days. Waring in his "Therapeutics" says that digitalis when given in small, long-continued doses is apt to accumulate in the system and suddenly induce poisonous and even fatal effects. On the other hand, there seems to be some doubt as to whether we all have exactly the same idea of what we mean by this term, and some authors—and they are not a few—assert that a cumulative action does not occur. Thus Beaumont Small, in the "Reference Handbook of Medical Science," supplementary volume, expresses this idea, and Bartholow "agrees in opinion with those who hold that digitalis is not a cumulative poison in the sense in which this term was formerly used." On the other hand he admits that "doses of digitalis frequently repeated one after another, so that the effect of one is added to those before given, will certainly produce toxic symptoms," as will all other poisons used as medicines.

It seems to me that this is to a great extent exactly what happens in those cases in which what I call "cumulative effects" take place, and I do not believe that digitalis possesses any uncanny cumulative power of an extraordinary kind. On the other hand I do believe, not only from experience but from its known action given in small doses in all cases, that the ground for the assertion that digitalis is peculiarly apt to cause a cumulative result is very firm. In the administration of remedies we are not sufficiently governed by the speed of their absorption and elimination, and particularly is this true of digitalis. Again, we are apt to overlook the fact that certain drugs produce an effect which is prolonged. This is also particularly true of digitalis, for not only does its influence last for several hours but often for several days. Again, there are certain states of the body which hinder absorption for a time and delay elimination, and also prevent this drug from acting while in the blood; as gastric atony in the first case, renal spasm or disease in the second, and fever in the third. In other words, while it is true that any drug has a cumulative effect when given too often, it is also true that digitalis can more readily be given too often than many other drugs. Again, the very physiological effect of digitalis tends to make it accumulate, for as Brunton points out, digitalin when taken for several days causes a decrease in the flow of urine, and this is due to spasm of the renal blood-vessels, which may be so great as to cause suppression of urine.

It therefore stands to reason that the frequent repetition of full doses must lead to its accumulation in the body, for the supply is greater than the amount eliminated. Such an accumulation with the production of a profound effect is met with when any drug which is slowly eliminated is given frequently in full doses; as for example in the case of bromide of potassium, where with each succeeding day and dose, the dose being the same, the sedative effects are more marked. Waring asserts that the bromides are sometimes taken in large doses for several days without effect, and thus a cumulative effect comes on.

In this case, however, the effects are gradually increased and the physician can measure the depth of the influence of the drug more accurately than when digitalis is given, for a peculiarity of the overaction of digitalis is that the symptoms entirely absent one moment are suddenly developed the next by some change in posture. Thus Brunton has pointed out that in many cases of heart disease the patient is much benefited by full doses of digitalis, but that it is dangerous for that patient to suddenly stand erect lest he have an attack of cardiac syncope due to the upsetting of the circulatory balance when it is under the influence of digitalis.

What the cause of this is we do not know. It is certainly not due to weakness, for the cardiac beats when they occur are in themselves more forcible than in health. The probable explanation of this peculiar cardiac irregularity lies in a disturbance of the co-ordinating apparatus of the various parts of the heart muscle. By this the author does not refer to the so-called co-ordinating centre of Kronecker and Schmey, which probably does not exist, but to the changes which may take place in the so-called "contraction wave"

which begins in the normal heart at the great veins and passes from them through the auricular walls to the walls of the ventricles. It has been found by Wooldridge and by Tigerstadt that if the auricles and ventricles be separated by a ligature or clamp they still continue beating, but no longer do so synchronously; or in other words the centres of each set of walls act independently of the others. The irregular action of the heart under digitalis is probably dependent upon this disassociation of its parts, and this theory is still further substantiated by the experiments of Roy and Adami, who have proved that independent contraction of the various parts of the heart can be produced by stimulation of the peripheral end of the cut vagus, a part of the nerve which is stimulated by digitalis in these large doses which we have been considering.

The reason therefore that the cumulative action of digitalis is more noteworthy than that of other drugs is that this effect is more apt to occur and to occur suddenly, and that it does not develop premonitory symptoms which force themselves as warnings upon the physician who is careless in its use or does not know the susceptibility of his patient.

That the symptoms to which the term "cumulative effect" is applied are practically identical seems proved by general concensus of opinion regarding them. Thus Von der Heide agrees with Withering (An Account of the Foxglove and Some of its Medical Uses, 1785) that two sets of phenomena take place: first, abnormal cardiac slowing, an irregularity, smallness and rapidity of the pulse after large doses; and second, vertigo, nausea, cramps, and sleeplessness. Husemann speaks of these circulatory and nervous effects, and of the slow, small and intermittent pulse; and as Edes says, most authors intend by the use of this phrase "cumulative action" to denote the sudden supervention of toxic symptoms, and in most cases a rapid, or at any rate a feeble and irregular, pulse.

Again, we find in Soullier's Thérapeutique (*loc. cit.*), published in Paris in 1895, that the dominant symptoms of digitalism, or that condition resulting from the overuse of this drug, are gastro-intestinal disorders, nausea and vomiting, cold sweats and general malaise. The pulse is exceedingly slow and filiform, and finally arrhythmical. Sometimes convulsions, dilated pupils and respiratory oppression are met with, and this condition arises from the retardation of the absorption of the first doses of the drug. Reil states that the symptoms consist in pain in the epigastrium, nausea, great feebleness, amblyopia, and a feeling of weight in the head. Durozicz (Académie de Médecine, Mai 27, 1879) mentions the abuse of the alcoholic preparations of digitalis, and after naming a somewhat similar train of symptoms as already given as resulting from overdoses, he states that symptoms simulating meningitis may occur. Trousseau has also pointed out that full doses produce hallucinations, delirium, and a slow pulse of 32; and this is endorsed by Peter (*Bull. de Thérap.*, 1883, p. 108). The statements of Durozicz, Trousseau and Peter refer rather to poisoning than to effects resulting from cumulation, but it is of interest to note that the symptoms are much the same. It is also of interest to note that Raymond Tripier (*Revue de Médecine*, 1883, 1884, 1885) points out that in some persons digitalis causes a slow pulse, syncope or epileptiform attacks, cardiac arrhythmia or bigeminal pulse, digestive disturbance, and pains resembling those of rheumatism in the limbs. It is evident therefore that the circulatory disorders under digitalis are practically identical whether a poisonous dose be taken at once; or it accumulates slowly and is then all absorbed, which is practically equivalent to one large poisonous dose; or that a person with an idiosyncrasy is poisoned by a dose which would not poison an ordinary individual. Soullier goes so far as to state that in the presence of digitalin we should institute treatment consisting of coffee, or caffeine, and strychnine.

In order that I might obtain a concensus of opinion from those best able to speak of this matter in an authoritative manner I sent the following series of questions to a large number of eminent practitioners and teachers, and have drawn the following information from their replies:

These gentlemen were: I. E. Atkinson, M.D., Professor of Therapeutics in the University of Maryland, Baltimore; F. C. Shattuck, M.D., Professor of Clinical Medicine in Harvard University, Boston; H. C. Wood, M.D., Professor of Therapeutics in the University of Pennsylvania, Philadelphia; W. H. Thomson, M.D., Professor of Therapeutics in the University of the City of New York; Abraham Jacobi, M.D., Professor of Diseases of Children in Columbia College, New York; James C. Wilson, M.D., Professor of the Practice of Medicine in Jefferson Medical College

of Philadelphia; Edward G. Janeway, M.D., formerly Professor of the Practice of Medicine in Bellevue Hospital Medical College; James Tyson, M.D., Professor of Clinical Medicine in the University of Pennsylvania; James T. Whittaker, Professor of the Practice of Medicine in the Medical College of Ohio; Dr. John H. Musser, Assistant Professor of Clinical Medicine in the University of Pennsylvania; Dr. T. Lauder Brunton of London; Dr. G. L. Peabody, Professor of Materia Medica and Therapeutics in the Medical Department of Columbia College; Dr. A. D. Blackader, Professor of Materia Medica and Therapeutics in McGill University, Montreal.

1. Do you believe in the possibility of, or have you met with, the so-called cumulative action of digitalis?

2. If so, under what conditions has it occurred as to disease, dosage, and age of patient? Or, in other words, what do you think predisposes to the development of these effects?

3. If you have met with it, what have been its chief manifestations?

4. What preparation of digitalis is most apt to produce this condition?

5. Has the presence of fever in your experience interfered seriously with the production of the physiological effects of digitalis?

In answer to Question 1—"Do you believe in the possibility of, or have you met with, the so-called cumulative action of digitalis?"—Dr. I. E. Atkinson, of Baltimore, states that he believes it possible for digitalis to produce cumulative effects, and he has seen two or three cases which have given very positive evidence of cumulative action.

Dr. Frederick C. Shattuck, of Boston, does not believe that digitalis possesses any more cumulative action than any other powerful drug which is given in full dose, particularly if there be idiosyncrasy present.

Dr. H. C. Wood, of Philadelphia, makes the following characteristic reply: "May I answer your inquiries in regard to the so-called 'cumulative action of digitalis' by saying that those who deny its existence are in a similar position to the famous King of Siam, who banished from his Court in deep disgrace the traveler who told him that he had seen the tops of rivers so solid that one could walk over them?"

A belief in the cumulative effect of digitalis is also recorded by Jacobi, who, when asked for an opinion, referred me to his "Therapeutics of Infancy and Childhood," in which he says: "When large doses have been given for some time, accumulation of the effect takes place."

Dr. William H. Thomson has also met with this condition, and reports a case (see further on).

Dr. J. C. Wilson states that he has "never encountered the cumulative effects of digitalis."

Dr. Janeway replies that he has met with it.

Dr. Tyson states that he has met with it, although he does not believe that the term conveys an idea of the mode of its production.

Dr. Whittaker replies: "I do believe in the possibility, and have seen cases, of excessive action; whether it could be called cumulative or not I am not prepared to say from my own experience."

Dr. Musser has "never met with it and does not believe in it."

Dr. Lauder Brunton writes as follows:

MY DEAR HARE—I think that digitalis is cumulative; at any rate one certainly finds that after it is used for a while disagreeable symptoms occur. In my own experience these are generally shown first by the stomach in the form of nausea and vomiting. Just the other day I had a case in the Hospital where under the influence of digitalis great improvement occurred at first, then the pulse became more rapid and irregular. Instead of increasing the digitalis, as it was my first impulse to do, I knocked it off entirely and put the patient upon bismuth and soda, as I considered that the cardiac disturbance was the reflex from the stomach and that the gastric disturbance was due again to digitalis. The result appeared to show the correctness of my ideas, as the patient began to improve forthwith. I almost never give it in fever, so that I cannot answer your fifth question, nor can I say which preparation of digitalis is most apt to cause disturbance. The whole question is an exceedingly complicated one, and I regret I cannot give you more definite answers.

Dr. Peabody has never met with this phenomenon.

Dr. Blackader replies: "Yes; to some extent. Too frequently repeated in large doses it may accumulate in the system more rapidly than it is eliminated."

In reply to Question 2—"If so, under what conditions has it occurred as to disease, dosage, and age of patient; or, in other words, what do you think predisposes to the development of these effects?"—Dr. Atkinson states: "The cases have always been of organic heart trouble, when the patients have continued to take digitalis upon their own responsibility and for protracted periods—in one case for nearly three months."

Dr. Shattuck states: "I have seen the toxic—cumulative—effects of digitalis under the greatest variety of diseases, dosage, and age.

It has seemed to me, speaking broadly, that the greater the real necessity for the drug the less the danger of toxic action, and yet now and then I come across a case, as that mentioned, where a drug similar in its action to that of digitalis agrees while the latter distinctly disagrees. A predisposition to toxic effect depends, as it seems to me, on (*a*) ill-judged exhibition—giving the drug when it is not required—and (*b*) individual peculiarity not to be known beforehand."

Dr. Wood states in his book that it is connected with slow absorption and elimination, and is much more prone to occur when there is no diuretic effect. It is very apt to take place after tapping. Brunton thinks this effect is apt to take place at the development of crisis in fevers.

Dr. Janeway has met with the cumulative effect especially in Bright's disease, and possibly occasionally in pneumonia and in heart disease. He thinks the conditions produced by the continued use of the drug, and that pushing the drug when the heart has become slowed or irregular soon develops the cumulative effect.

Dr. Tyson says it occurs under circumstances which interfere with a prompt absorption of the drug, or at least its transmission to the centres in which it acts in producing its effects, followed by a sudden removal of such obstacle. Such removal is brought about by brisk purgation, by the removal of accumulations of fluid in the peritoneal or pleural cavities, and especially by a bloodletting practiced when such obstacle exists.

Dr. Whittaker says: "The excessive action has resulted from too long administration —that is, from use continued after the effects of the remedy had been obtained."

Dr. Blackader says: "Untoward symptoms are most apt to develop when the heart muscle is to any degree diseased."

In answer to Questions 3 and 4—"If you have met with it, what have been its chief manifestations? What preparation of digitalis is most apt to produce this condition?"—Dr. Atkinson says "the chief symptoms have been profound debility with a tendency towards syncope, nausea, very slow pulse while in a recumbent posture, becoming rapid and feeble upon exertion. He has no recollection or memoranda of effects upon the vision or kidneys. The urine was not suppressed. Recovery followed within a few days after the drug was abandoned. The dose had not been increased and was not large." His cases used the tincture.

Dr. Shattuck states: "The toxic effects as far as I have seen them—and they have occurred many times under my observation—are anorexia, nausea, vomiting, a weakened and irregular pulse, and diminution in the urine. The toxic effects depend on the purity of the drug rather than the preparation."

Dr. Wood also states (see also answer to Question 1) that sometimes the first marked symptom of this action is severe syncope, followed by paraplegia, vomiting, diarrhea, insensibility, and death. Usually, however, only the change in the pulse occurs if the drug is not pushed.

Dr. Wood reports: "A single case from my own experience will suffice: A woman was taking digitalis freely, with the hope of bringing about absorption of a pleuritic effusion; after many days no effect was manifest from the drug, until suddenly her pulse, which had been running about 90, fell to 75. The use of the digitalis was immediately discontinued. The next day the pulse was 60; the next day, 50; the next day, 40; with all the characteristics of over-digitalis action. It was nine or ten days before the pulse had regained its normal rate. In conclusion I see no reason for supposing that one preparation is more apt than another to accumulate."

Dr. W. H. Thomson, of New York, replies as follows: "I can report one unmistakable case of dangerous and specific symptoms of cumulative action of digitalis in a phthisical patient, female, aged 25, after taking Niemeyer's pill, one three times daily, containing one grain of powdered digitalis, for six days. There was no reason to suspect that the pills themselves had accumulated in the primæ viæ previous to the sudden onset of the symptoms, which were deathly nausea and vomiting continuing for eighteen hours, with very intermittent pulse. Every measure failed to stop the vomiting until half a grain of morphine was given subcutaneously, which then arrested it. Patient lived for two years afterwards without any similar experience. There was no renal element in this case."

Dr. Jacobi (*loc. cit.*) says the pulse becomes quite slow and irregular and vomiting sets in in this condition.

Dr. Janeway has found the chief manifestations of this state to be sudden death on exertion, and he adds: "I have in the past on several occasions made post-mortem examinations of persons who had been under treatment in hospital with digitalis who had dropped dead on going to the water-closet; also in pneumonia under treatment with digi-

talis some are inclined to hold sudden death due to digitalis. It is somewhat difficult to be certain in these cases."

Dr. Tyson replies "almost solely slowing of the pulse, at times to 40 or even less beats per minute." He does not think it is peculiar to any form of the drug, though he has met it most frequently when using the tincture.

Dr. Whittaker says: "The chief manifestation was the hard, slow pulse, with subsequent exhaustion of the heart, and paralysis. I have seen the condition only after the use of the infusion, which is usually given in larger dose."

In reply to Question 5—"Has the presence of fever in your experience interfered seriously with the production of the physiological effects of digitalis?"—Dr. Atkinson states as follows: "In my experience the presence of fever modifies the action of digitalis very profoundly; in the various febrile conditions in which the heart often shows evidence of failing (typhoid fever, pneumonia, etc.) digitalis is notably inferior to strychnine and alcohol, and indeed as a rule fails to influence either the frequency or force of the heart's action or to increase arterial tension. In my experience the febrile condition in great measure prevents the action of digitalis, as shown in the afebrile state."

Dr. Shattuck states: "I have thought that a febrile patient seemed less likely to be upset by digitalis—or evidently so. I may add that if I prescribe digitalis for a patient who cannot communicate with me promptly and whose condition is not urgent, I am apt to give the drug only twice a day at twelve-hour intervals. This is with the idea of diminishing the liability of toxic or unpleasant effects of the drug."

Dr. Thomson states: "In my opinion digitalis has no beneficial effect upon the heart when weakened by fever. In diphtheria its effect is most disastrous."

Dr. J. C. Wilson: "The effects of digitalis are not manifested in febrile cases in the same way nor to the same extent as in other conditions. This has appeared to me, however, to be due not so much to high temperature as to associated derangements, especially in part malnutrition of the heart muscle."

Dr. Janeway replies that in his experience the presence of fever "does not necessarily" interfere with the effects of digitalis.

Dr. Tyson replies: "I cannot say that I have observed such interference."

Dr. Whittaker says: "It seems to me that the presence of fever, by delaying the absorption of the remedy, interferes with its physiological effects."

Dr. Musser says that he has never secured physiological effect in the presence of fever.

Dr. Peabody thinks that fever does interfere with the effect of digitalis.

Dr. Blackader states that the presence of fever to some extent antagonizes the action of digitalis, and therefore demands a larger dose to produce the same physiological effects.

Reil has remarked upon the fact that cumulation occurs less frequently when digitaline is given than when the infusion is used, because he thinks that digitaline gives warning of its excessive effect, whereas the infusion does not.

It is interesting to note in connection with the answers to the last question, as to influence which the presence of fever exercises upon the action of digitalis, that almost every therapeutist recognizes that fever does prevent digitalis from acting. In my earliest days as a physician in charge of patients in the wards of a large hospital I noted this fact, and on searching for similar experience as recorded in literature I found both such experience and careful pharmacological research pointing to the truth of my observation. Thus as long ago as 1865 Thomas recorded the fact that digitalis does not act in certain cases of pneumonia, and Brunton and Cash then proved that the failure of the drug to slow the pulse depended upon the fact that the inhibitory action of the vagus centres, ordinarily stimulated by digitalis, is lessened by heat, and that the peripheral ends of the vagus are also depressed. A belief that this cause exists for the non-appearance of the physiological action of digitalis is expressed by Wood.

MALARIAL HEMATURIA.

By J. W. Meek, M.D.,
Camden, Ark.

In the October number of the Therapeutic Gazette is a review of The American Textbook of Applied Therapeutics, and the reviewer criticises Dr. Dawson's treatment of malarial hematuria by the quinine method. In the December number appeared a criticism of Professor Tyson of Philadelphia for advocating a similar treatment in his Textbook of Medicine, recently issued.

I have not seen Dr. Dawson's article, but have read Professor Tyson's, and I desire, as one who has had some experience with this

malady, to add further *emphasis* to your criticism, and in the name of humanity to protest against a further promulgation of the idea that quinine is admissible in the successful treatment of this affection.

I know nothing of Dr. Dawson's opportunities for observing this disease; he may speak from personal observation or the contrary. Professor Tyson claims to have had considerable experience with the malady.

I will say this, that if quinine is curative of malarial hematuria in Philadelphia, it is certainly a disease very different from that occurring in Arkansas.

Malarial hematuria is, in North America, confined almost exclusively to the Southern or Southwestern States; moreover, it is rarely seen in cities, but is chiefly confined to rural districts. As a rule our ablest medical investigators live in the cities, and hence rarely see it. Furthermore, the men who write our text-books of medicine (I speak it to the shame of my Southern brethren) nearly all live in the North.

From this it will be seen that many of our best physicians, or at least our ablest scientific investigators, rarely see a case, and many of our text-book authors have perhaps never seen one. "Swamp doctors" as a rule do not write for publication, and the history of malarial hematuria has not been written by those who have met it face to face and engaged it in deadly combat.

It sounds very plausible to say that malarial hematuria is caused by the malarial parasite, and hence quinine is necessarily the remedy, but this species of reasoning affords but little consolation to the conscientious physician in the hour of humiliation and defeat; nor do the statistics of this treatment warrant the premise that the disease is essentially malarial in its origin. Professor Tyson says, page 72 of his text-book: "If quinine fails to break up the paroxysm of the mildest form, when administered as directed, the hematuria has an origin other than malarial." Now in my experience and that of many others it not only fails to arrest the paroxysm but aggravates every symptom, and adds very greatly to the mortality of the disease.

The diagnosis of some diseases is at times *only* positively made by the administration of certain remedies and an observance of the therapeutic action of the drug administered. Thus the curative action of mercury and iodide of potassium, administered in certain obscure affections, is considered positive proof of the specific nature of the malady thus cured, and the immediately curative action of quinine is and should be proof of the malarial nature of the disease thus treated. Judged by this rule malarial hematuria cannot be classified as a strictly malarial disease.

It is to be regretted that there seems to have been no blood examinations by competent bacteriologists to determine the presence of the malarial parasite or other organism. A proper examination will probably discover a bacterium at present unknown.

The mortality from this disease is not so heavy as it was twenty years ago, and at that time it was treated almost exclusively by massive doses of quinine.

During the first ten years of my professional life I treated quite a number of cases with large doses of quinine—twenty, forty and sixty grains being given in twenty-four hours—and the mortality was at least fifty per cent. Since that time I have treated quite a number without quinine, and the mortality has been eighteen per cent. The cases treated without quinine were as severe as those treated with it.

Dr. Guise, of Mississippi, reports having seen about twenty-five cases treated with quinine, and a mortality of more than fifty per cent.; and he also reports four cases treated without quinine, all of which recovered. Four successful cases is too small a number to prove the success of any method, but twenty-five cases with a mortality of fifty per cent. would not encourage one to pursue that plan. Hyposulphite of sodium has in my hands and also in the hands of others proven decidedly curative in this affection, but in my experience it has proven of little value in other forms of malaria. This to my mind establishes another point against the malarial origin claimed. The disease undoubtedly occurs almost if not exclusively in malarial regions, and nearly always in persons who have shown previous evidence of malarial toxemia; but malaria may be only a Trojan horse by which the gates are unbarred to admit a more deadly foe to the citadel of life—the patient's blood.

In the THERAPEUTIC GAZETTE for July, 1892, Prof. H. A. Hare, of Philadelphia, has with a commendable zeal made an effort to collect the experience of medical men who have had to deal personally with this disease. It is to be regretted that such authors as Osler, Pepper and other justly eminent authorities have not done the same before giving the sanction of their text-books to the stereotyped treatment by quinine, etc.

Professor Hare has, in reply to his inquiries, received the following from physicians practicing in Texas, Mississippi, Georgia, and Alabama:

Nineteen physicians, whom he classes as "experienced," consider quinine "useful" in this disease, but twenty-eight—"experienced"—consider it "harmful." This gives a decided majority of "experienced" ones against its utility. Of course the reader can form no idea of the comparative abilities of these respondents. The replies from those whom he classes as "inexperienced" are largely in favor of quinine. The knowledge of the latter class has doubtless been gained from text-books, and it would appear from an analysis of the above replies that experience with the malady changes the views of a large majority.

It is not my intention to enter into a full description of this disease, nor into all the details of what I consider the proper treatment. My main object in inditing these lines is to lift up my "voice as of one crying in the wilderness" against the evil of advising the use of quinine in this disease. I am not an enemy of quinine in the abstract. I give it with a free hand—frequently thirty to forty grains per diem—with the happiest results in other maladies, but I desire to see the profession set the seal of their eternal reprobation on its abuse in malarial hematuria.

A few words in regard to the clinical history and treatment and I am done.

The subject has usually been suffering with an intermittent fever, and has almost invariably taken quinine the day he is attacked. A chill ushers in the attack; bloody urine appears in from one to three hours; febrile reaction is not usually above 102° or 103°. The skin and conjunctiva become intensely yellow in from two to six hours. There is constipation and great gastric irritability. The vomited matter is frequently green, and late in the disease becomes black—a "coffee-ground" color. Rigors frequently occur every six hours. The urine is usually at first increased in quantity, but later becomes scanty; it gives a heavy albuminous deposit from heat or nitric acid, and under the microscope shows blood casts and red blood-corpuscles. The jaundice is, judged by the rapidity of its progress, necessarily hematogenous. A complete obstruction of the common bile-duct could not produce such an immediate discoloration. Some subtle poison has gained entrance to the vital fluid—is breaking down the red blood-corpuscles—producing an explosive hemoglobinemia; hence the jaundice is due to pure hemoglobin in the blood. If this condition is not soon arrested the vital fluid becomes incapable of stimulating the nervous centres to a performance of their functions, vaso-motor paralysis occurs, the blood is emptied into the larger internal veins, and the patient is bled to death into his own blood-vessels. This is the disease as it occurs in Arkansas.

Some patients are stricken down as if by a blow and will die in spite of all remedies, but this class is fortunately small. In the *New Orleans Medical and Surgical Journal*, November, 1891, I concluded an article on the subject of malarial hematuria with the following recommendations, which I cannot now improve upon:

1. Give hyposulphite of sodium in drachm doses every two hours until the patient is thoroughly purged; then continue in smaller doses until the system is saturated with it.

2. Give morphine and atropine hypodermically, sufficient to quiet stomach; also blister the epigastrium if necessary.

3. Give an abundance of water to wash out the coagula that must necessarily accumulate in the urinary tubules after a hemorrhage.

Hot water or hot lemonade is frequently better borne by stomach than cold. Cupping over the loins is also to be recommended.

4. The diet should be mild. Fresh buttermilk is usually well borne by the stomach and is also a mild diuretic, and I have come to rely on it as an article of diet in this as in many other diseases.

5. Keep patient in a strictly recumbent posture.

I give hyposulphite of sodium in this affection for the following reasons:

a. It is a stimulant to the hepatic secretion, causing in large doses abundant biliary secretion, and is also a valuable intestinal antiseptic.

b. I believe that free sulphurous acid is disengaged in the blood, and that this agent is an antizymotic to such an extent that it destroys the micro-organism which is the real cause of the disease, and thus arrests the process of corpuscular disintegration.

REPORT OF A CASE OF PUERPERAL SEPTICEMIA TREATED WITH NUCLEIN.

By Henry M. Joy, M.D.,
Grand Rapids, Mich.

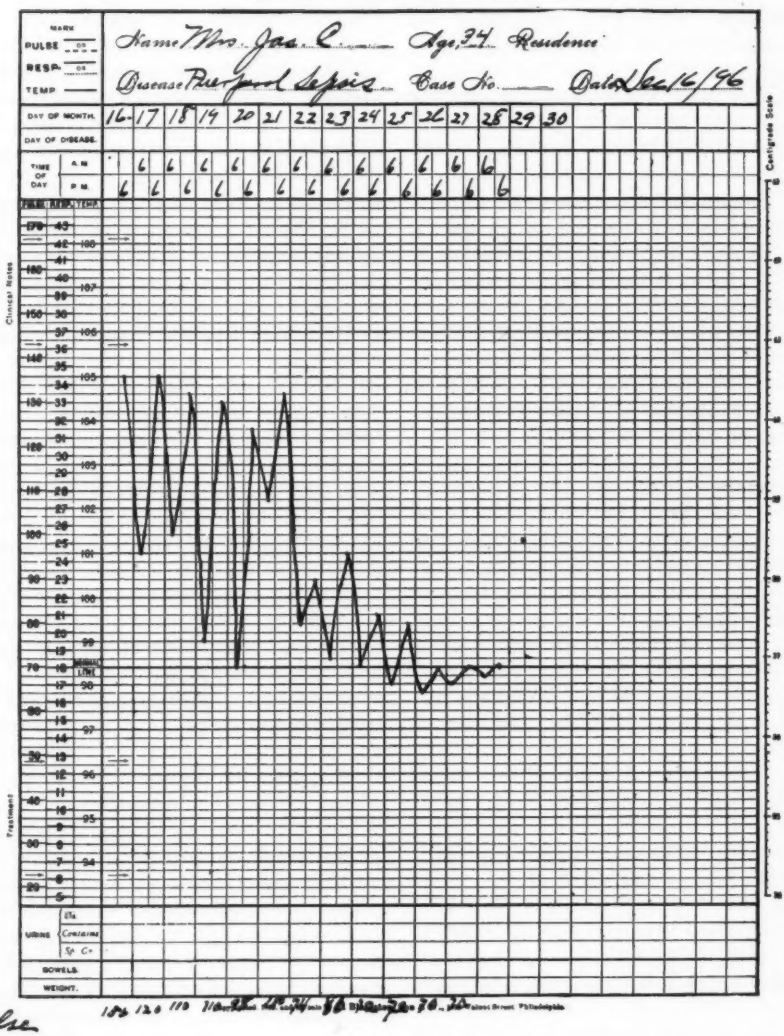
The treatment of puerperal septicemia must of necessity be considered from two standpoints, namely, surgical and medical.

The first has for its consideration the removal or limitation as far as possible of the source from which the toxic elements are supplied to the blood, and the second the aiding of Nature in her efforts to overcome the poisons already in the system. In other words, to increase the antitoxic constituents of the blood or to strengthen those constituents which are already present.

A report of the following case in connection with the fulfilment of the second indication will I think be of interest:

On December 10, 1896, I was called to attend Mrs. C. in her second confinement. I found the patient in good physical condition. The child was lying in second position, vertex presenting. The case was conducted with the greatest possible antiseptic precautions, and labor was completed naturally in about six hours. The patient being out of the city I did not see her again until the morning of the sixth day, when I was hurriedly summoned to attend her. I found that the previous night she had had a severe chill lasting about an hour. At the time of my visit the temperature was 105°; pulse 150, feeble and thready. Abdomen greatly distended and very tender on pressure, skin icteric, and a condition of marked apathy denoting most profound sepsis. A vaginal douche of creolin solution was administered at once, followed by an intra-uterine douche

GRAPHIC CLINICAL CHART. Designed by J. P. Crozer Griffith, M.D.


Name Mrs. Jas. C. Age 34 Residence
Disease Puerperal Sepsis Case No. Date Dec 16/96
DAY OF MONTH 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
DAY OF DISEASE
TIME OF DAY A.M. P.M.
PULSE RESP. TEMP.
Centigrade Scale
Clinical Notes
Treatment
URINE
BOWELS
WEIGHT
Pulse
150 120 110

of the same solution. My attention having been called to the use of Parke, Davis & Co.'s nuclein in puerperal septicemia,* and having had satisfactory results from its use in cases of surgical sepsis, I ordered one drachm of the five-per-cent. nuclein solution (P., D. & Co.'s) to be given internally every three hours. The day following the nurse in charge of the case reported a slight chill followed by a temperature of 105°, pulse 110, but general condition of patient somewhat improved.

Vaginal douches were given daily by the nurse, and nuclein continued as before. No recurrence of the chills occurred after the second day. The temperature remained approximately the same for six days, when it fell by crisis (see chart). Although during the first six days there was little variation in the height of the temperature, the daily remissions were marked, and the pulse continued to fall steadily and improve in quality, the general condition being one of progression. The patient's mental condition changed rapidly for the better, appetite returned, and the skin assumed its normal color.

Nuclein, then, is a remedy which aids us in fulfilling the second indication in the treatment of puerperal septicemia—*i. e.*, the strengthening of nature's antitoxic elements. It acts favorably and promptly upon leucocytosis, it causes no unpleasant complications or effects, it acts rapidly, and under its use the fetid discharges quickly diminish.

THE PASTEURIZATION OF MILK.†

By J. P. Crozer Griffith, M.D.,
Clinical Professor of Diseases of Children in the University of Pennsylvania.

Sterilization of milk was practiced empirically long before much was known of its scientific principles. It has been known by mothers for years that milk was less liable to derange an infant's digestion if it was scalded before being used; and it has long been the practice of physicians to recommend the boiling of milk and the subsequent keeping of it on ice in order to prevent decomposition taking place. The preservation of milk by long boiling was recommended from a scientific standpoint by Solltman, Albu, Bertling, and others. So, too, the modification of this process, consisting in the steaming of milk in a water-bath, antedated the studies of Soxhlet, and was advised by Röder, Hartmann, and others. The first, however, to devise a method both scientific and practical, for the sterilization of milk at the infant's home, appears to have been Soxhlet, writing in 1886. The characteristic of his method which distinguished it from any preceding one was that the milk for each feeding was sterilized in its separate bottle, and the number of bottles with their contents, sufficient to last the entire twenty-four hours, were all sterilized at once. By this plan was avoided the opening of a large vessel of sterilized milk in order to take out the amount required at different times, and the attendant danger of reinfection of the remaining milk. In all previous methods the milk was sterilized in bulk. Later sterilizers are all made on the Soxhlet principle. For practical purposes a single steaming in the sterilizer is sufficient, since the bottles will be placed on ice in any case afterwards as a matter of precaution, and the milk will be used within twenty-four hours. In very hot weather it is not a bad plan to resterilize in the evening the bottles which remain. Flügge has shown, too, that five minutes at a temperature of 100° C. (212° F.) is as good as forty-five minutes; yet he recommends an exposure of ten minutes; and in practice a longer time is conveniently employed.

Now it is well known that boiled milk has a decidedly altered taste and odor, and it is certain that even milk sterilized in special apparatus will show this same alteration. But what is far more important is the fact that the heating of the milk to the boiling temperature produces chemical changes which may seriously affect its digestibility. Leeds found that a temperature of 100° C. coagulated some of the lactalbumen, while it rendered the casein less coagulable by rennet, and made it less easily acted upon by pepsin and pancreatin. In the case of many children this alteration appeared to make but little difference; in others, however, the assimilability of sterilized milk was certainly much diminished, and the infants did not appear to thrive upon it. These observations have been confirmed by others. The effort consequently has been made to discover a method by which the milk might be rendered free from germs and yet have its taste and digestibility unaffected.

Pasteur found in 1868 that wine exposed for a short time to a temperature of 55° C. (131° F.) would not spoil. Later investigations based on this discovery have developed the method which now commonly goes by the

* Boise: Treatment of Puerperal Septicemia.

† Read before the Philadelphia Pediatric Society.

name of pasteurization; this consisting in the exposure of milk or other liquids to a temperature ranging from 55° to 80° C. (131° to 176° F.) and followed by rapid cooling. As applied to milk it has been found that a temperature of 75° or 80° C. (167° to 176° F.) would kill nearly all the pathogenic germs, and either kill or practically destroy the action of the germs producing milk-decomposition. It would not however destroy the spores; consequently the element of rapid cooling is an important one in the process, in order to prevent the development of these spores later.

The apparatus used by Pasteur was a simple one, consisting merely of a vessel holding wine, the bottom of which was substituted by a receptacle holding water. The water was heated up to 80° or 90° C. (176° to 194° F.) by a fire beneath. When the wine had reached the temperature of 55° C. (131° F.) the process was complete. According to Bitter, Thiel was the first to apply this principle to milk; and after him numbers of pasteurizers have been devised, many of them expensive and elaborate, and intended for the commercial preparation of pasteurized milk. All of them aimed to heat the milk to such a temperature that germs would be rendered harmless and yet the character of the milk remain unaltered. It has been found that a temperature of 80° C. (176° F.) will produce the undesired changes, and even at 70° C (158° F.) the alteration begins; consequently the temperature employed must be below this. The most important pathogenic germs are killed at a temperature varying from 55° to 70° C. (131° to 167° F.). Probably we are safe in estimating the temperature sufficient for the destruction of the tubercle bacillus to be 68° C. (154° F.), for the typhoid bacillus from 55° to 60° C. (131° to 140° F.), and for the diphtheria bacillus about 58° C. (137° F.). Most of the saprophytes will be killed at a temperature of 65° to 75° C (149° to 167° F.). It is clear then that if we pasteurize milk at a temperature of 68° to 75° C. (154° to 167° F.) we shall not materially alter its taste and digestibility, but we shall render it practically germless. Bitter and Freeman have each found 68° to 69° C. (154° to 156° F.) the suitable temperature for the purpose. Pasteurization can therefore be recommended as a very satisfactory substitute for sterilization, without the disadvantages of the latter.

I wish, however, to call attention to the following limitations of the process: In using pasteurization we are always on the edge of danger. We are much more liable than with a temperature of 100° C. to have decomposition of the milk take place later. Milk which has been pasteurized will not keep as long as sterilized milk. We are not comparatively safe, as with sterilization, in leaving the milk in a warm place. It should always be kept cool, and when possible on ice. In the heat of summer, in the case of poor families where one has reason to distrust the ability to keep the milk cool, I should much rather depend upon sterilization, believing that this with all its faults is much safer than using milk not prepared at all, or that which pasteurization has rendered only partially safe—that is, deceptively unsafe. But under any other conditions pasteurization is certainly much to be preferred.

Then I want to utter a warning against the makeshifts for pasteurization which are recommended by some physicians. In this process we are dealing with temperatures which allow of little variation. Consequently to tell a mother—as is often done—to fill the bottles with milk and place them in a dish-pan of boiling water just removed from the stove is in my opinion a very dangerous thing to do. We do not know what temperature is attained in this way, whether too low to be of any value or so high that we are getting all the disadvantages of sterilized milk. It is far safer to scald the milk in the old-fashioned method. Even with so good an instrument as the Arnold sterilizer the accurate pasteurization of milk is a difficult matter. If we leave the hood off of the sterilizer and set the lid ajar, we will find that the temperature varies from 80° to 90° C. (176° to 194° F.) — a temperature entirely too high — depending upon the heat of the fire. And even if we use a thermometer and sit down and watch the pasteurization, it is almost impossible to obtain a uniform temperature in this way. What is needed is some simple apparatus which any nurse-girl can use and which will give accurate results. Such an apparatus is the pasteurizer devised by Dr. R. G. Freeman, of New York. It consists simply of a metal pail, into which fits a receptacle holding the bottles to be sterilized. The receptacle is so made that each bottle fits into a separate small metal cylinder slightly larger than the bottle. In using the apparatus the pail is filled with water to the level of the groove running around it; it is then placed on the stove and the cover put on. The proper amount of milk for each feeding is put into each bottle, the bottles corked with raw cotton and placed in the receptacle. Water is

then poured around them into each cylinder, in order to prevent the direct action of the hot water in the pail from cracking the bottles. As soon as the water in the pail is boiling it is removed from the fire and placed out of the draught upon a non-conducting substance. The lid is now removed, the receptacle put in and the lid reapplied. It is left thus for forty-five minutes, when the lid is removed and the receptacle elevated so that it rests upon supports which hold it partially out of the pail, and a stream of cold water is now turned into the pail for fifteen minutes. The bottles are then kept on ice till needed. The principle of the apparatus is the fact that the given quantity of water which is in the pail will, in cooling, elevate the temperature of the milk to the desired degree; so that the two liquids become of the same temperature at 68° to 69° C. (154° C. to 156° F.). Receptacles are made either for ten six-ounce bottles or seven eight-ounce bottles, and either receptacle will fit into the pail.

Freeman has made thermometric experiments with the apparatus. He finds that in the first five minutes the milk rises to a temperature of 50° to 55° C. (122° to 131° F.); in ten minutes it reaches 60° to 65° C. (140° to 149° F.); and in fifteen minutes has reached 65° to 68° C. (149° to 154° F.). It continues at about 68° to 69° C. (154° to 156° F.) for the remaining thirty minutes, at which time the cold water is turned on; in fifteen minutes from this time the milk has dropped to the temperature of the cold water used. He recommends that when the milk is first received from the milkman it be put in the refrigerator. But he finds that whether the milk be put into the bottles at 10° C. (50° F.) or at 20° C. (68° F.), the approximate temperature of the room, the resultant temperature during pasteurization varies only 2° C. (3.6° F.)—an amount entirely insignificant.

In conclusion I have only heartily to recommend this apparatus to your consideration. I think it will spare you a world of anxiety and prove the saving of a vast amount of trouble to the mothers of your little patients.

I would acknowledge my indebtedness especially to the articles of Bitter (*Zeitschrift für Hygiene*, 1890, viii, 240); Flügge (*Zeitschrift für Hygiene*, 1894, 272); Soxhlet (*Münch. Med. Woch.*, 1886, Nos. 15, 16); Leeds (*American Journal of the Medical Sciences*, June, 1891); Freeman (*New York Medical Record*, 1892, ii, 8; *Archives of Pediatrics*, August, 1896).

SIMPLICITY AND PALATABILITY IN PRESCRIBING.

By Dr. A. L. Benedict,
Professor of Physiology and Lecturer on Digestive Diseases, Dental Department, University of Buffalo.

There are a few time-honored medical dicta that are to be found in most text-books and in all orthodox lecture courses, but which are usually promptly forgotten by the student and disregarded by the practitioner, unless he should be called to the chair of a medical teacher. In this category are the theoretical description of temperaments and the therapeutic phrase "*curare tute, cite et jucunde.*" Unfortunately, however, this last rule is often so drilled into the mind of the student by successive teachers of materia medica and therapeutics, and is so often found in the "general considerations" of various text-books on this subject, that the physician adheres to it as a practical guide, instead of allowing it to lapse into a harmless theoretical concept. Polypharmacy has its claim to respectability largely on the conception of "basis, adjuvant, corrigent, and vehicle." We have progressed from the old notion that a physician's professional standing was in direct ratio to the number of ingredients in his prescription, and we ridicule as a "shot-gun" prescription one calling for more than half a dozen drugs, unless—like some tonic and cathartic compounds—it is backed by some famous name. We have not, however, attained the moral courage necessary to prescribe one thing for one indication. A prescription calling for only one or two drugs occasions a sense of incompleteness; we pause before signing it, to think if we cannot add something—harmless at any rate—to keep the solitary drug or the pair company. On precisely the same principle some persons, after expressing the full idea which they have in mind, feel that their sentence is too abrupt unless they add "Don't you know," or some similar phrase.

Little as we agree with the symptomatic prescribing of the homeopaths, we must give them credit for originating and, so far as possible, adhering to the rational method of prescribing one drug at a time, and according to a definite system. We may not admire the superficial observations and the reliance on subjective symptoms involved in "proving" a drug, but we must respect the genuine homeopath for giving bryonia, with a definite idea and a firm faith, not because he has heard that it was "good for" a certain dis-

ease or because "he didn't know just what else to give."

Just as the charlatanism of phrenology was an effort—though perhaps not an honest one—in the same direction in which cerebral localization has recently made so much progress, so Hahnemann's system of drug-proving was an attempt—and, personally, I believe a conscientious and painstaking one—at solving the problems which pharmacology and physiological chemistry are now attacking on a rational and scientific basis. The ideal prescription is an equation between a definite understanding of pathology and an equally definite information as to the action of drugs. Unfortunately, the equation is not always possible; we are still ignorant of the true nature of many diseases; we are not infre quently confronted with practically insoluble problems in diagnosis; and there are many drugs which act, we know not how. The prescriber should, at least to himself, be keenly critical of his prescription and should know why he advises every ingredient, even if he has to confess at times that ignorance has forced him to empiricism.

In a very different sense from the accepted one, the ideas of basis, adjuvant and corrigent must still be borne in mind. Seldom does a disease depend upon a single pathological change so that it can be combated by a single remedy, and we may properly concentrate our attention on one indication as of prime importance. But even in these circumstances we must set each drug against its own indication and afterward consider whether harm will arise from administering all the bases, and which, if any, are to yield to the superior claims of others. But the conception here is quite different from that in which the prescription is a unity, with one drug supported by and modified by others. For example, in many cases of dyspepsia there is need of hydrochloric acid, of strychnine, and of iron. But who can say that among these aids to secretion, to motion and secretion, and to general nutrition, respectively, one is a basis, another an adjuvant, and the third the corrigent? We shall be very likely to regard the indication for iron as offset by the inability of the weakened organs to assimilate it, but the indication remains as urgent as before. Neither is it wise to combine the other two remedies, first, because the sour and bitter mixture will be very apt to excite vomiting; secondly, because the strychnine will act most efficiently on the empty stomach, while the acid is most needed toward the height of digestion. Again, in many cases of bronchopneumonia the indications are very clearly (1) to liquefy secretion; (2) to strengthen the heart; (3) to disinfect the air passages and favor resolution. To render the problem simpler, let us ignore the more modern and perhaps superior action of sprays and confine our attention to medicines administered by the stomach. Ammonium chloride, digitalis, and eucalyptol may be taken, respectively, as examples of the corresponding drugs, though various circumstances, including individual prejudices, may lead to the selection of substitutes for each or all. It is unwise to mix these drugs in one prescription, under the conception of basis, adjuvant, and corrigent. Such a mixture is physically incompatible, is extremely nauseating, and by upsetting the stomach is apt to nullify the desired cardiac stimulation. Ammonium chloride dissolved alone in water has merely a pungent, salty taste which is readily removed by a sip of plain, cold water. The digitalis, if given in tablet form, will scarcely irritate the most sensitive stomach, while the eucalyptol, or other volatile principle, is least disagreeable when taken in temporary emulsion with water or milk, followed by coffee or other drink to remove the taste. Again, the ratio between the various medicines should be a changeable one. For the first day, more liberal doses of ammonium chloride will be necessary than later; digitalis will usually have to be discontinued, or at least reduced, after four or five days; various unforeseen occurrences in the course of the disease may call for the increase or diminution of the dose of any one drug. This argument applies also to most cases in which indications for several different medicines coexist. Whether we consider economy, convenience, or palatability, it is usually better to order each medicine by itself.

The conception of corrigent is, unfortunately, a necessary one, simply because so many of our standard drugs have associated actions, some one of which may prove injurious. As we rely more on alkaloids and synthetic compounds and less on crude drugs, the less important will the problem of corrigents become. The matter of "crossed action" depends on the same difficulty of obtaining a drug whose action is simple and uncomplicated, with untoward tendencies. Sometimes the administration of a number of drugs means that we do not dare to give any one in a sufficient dose to overcome the

symptoms presented—not that a true crossed action is desired. Thus, in delirium tremens, we cannot safely give morphine according to its effect, but we may give as much as we dare of this alkaloid, follow it with hyoscine to the therapeutic limit, give a dose of bromide—not perhaps as large as would be compatible with safety, but so large that further increase would not be attended by increased physiological effect—add a moderate dose of acetanilid and of cannabis indica,—all without producing the desired result, so that we may be forced to chloroform anesthesia. In internal hemorrhage, we have the indication for some drug that will constrict blood-vessels, without similarly adding to the tone of the heart. Ergot probably fulfils this indication as well as any drug; but none is perfect. Thus the problem is clearly presented of effecting a crossed action by reducing the cardiac tone by a drug that will not lower vascular tone. Here again the therapeutic problem is unfulfilled—at least so far as the writer knows. The use of strychnine before or during anesthesia, the well meant but improper combination of nitrite of amyl with chloroform, the addition of carminatives to cathartics, are all illustrations of corrigent medication which is but a confession of the imperfections of our materia medica.

Regarding vehicles, very false ideas are current. Too many physicians, even among those who write for publication, foster the impression that a disagreeable drug can be "elegantly" given by adding a syrup and either a fruity or an aromatic flavor. This is comparatively seldom the case. Some persons are fond of peppermint or wintergreen, others of the various spices, others of rose, orange, lemon, etc. But any one of these flavors may be exceedingly disagreeable to a particular individual. Oil of wintergreen is often recommended as a salicylate—containing a high percentage of methyl salicylate—but the writer has found that most persons, even including those who express themselves as liking wintergreen, soon tire of the strong flavor and prefer the sodium salt. Strongly saline, bitter and oily drugs should almost never be given with a syrup. Salines are most easily taken well diluted and followed by a drink of plain water, which will remove the taste almost entirely. Bitter medicines, like strychnine and quinine, can usually be quickly swallowed in capsule, pill or tablet form, without offending the palate. Unless the sense of taste can be temporarily obtunded by a little cocaine, a strong volatile oil, or even a pinch of salt, many patients will prefer to take a disgusting medicine by itself, removing the taste by afterward drinking some strongly flavored beverage, such as coffee, rather than to mix a bitter and a sweet taste or to spoil by the medicine the flavor of something of which they are fond. Few physicians would use gravy into which the cook had put sugar instead of salt, but many will prescribe cod-liver oil "with a pleasant syrup to disguise the taste." There are a few palatable emulsions of cod-liver oil, but most of them will cause unpleasant regurgitations; and far more agreeable and less irritating to the stomach are the almost pure and tasteless oils which may be salted and taken clear or on bread. However, the writer holds the heretical view that crisp salt pork, cream, fresh butter, salad oil, fat meats, etc., are superior to cod-liver oil.

Iron and other heavy metals, as well as arsenic, may well be given in syrup. Two of the most palatable syrups are almost unused, that of raspberry and, best of all for the majority who like it, chocolate. The last, in spite of its superiority to all other vehicles—excepting that those who are not especially fond of it usually dislike it very much—is not even official. It is by all odds the best disguise for quinine, and it will nearly conceal other bitters and astringent mineral salts. It is also available for tablets and confections. A few syrups, like that of squill, are actively medicinal. This is to be regretted, as it ought to be possible to give all syrups *ad libitum*.

To sum up, the writer would advocate (1) the use of drugs according to known physiological actions, except when scientific ignorance and clinical experience render empiricism necessary and proper; (2) the use of one medicine at a time, unless coexisting pathological processes demand more; (3) the prescribing of medicines separately, unless it is reasonably certain that their conjoined administration will be safe and agreeable and that their relative doses will remain stationary; (4) the administration of disagreeable medicines in solid form, so that they may be swallowed untasted, unless physiological activity will be sacrificed; (5) the application of common-sense rules according to habits of eating and drinking, in administering medicines whose taste cannot be avoided by insolubility in the mouth. This last means that we shall not mix bitter and sweet things unless the bitter can be almost completely covered; that we shall transform acids into

lemon- or orange-ades or into "shrub" drinks; that we shall salt oily substances and not sweeten salty ones; that we shall respect idiosyncrasies; that when a taste cannot be covered, we shall not try to mix it, but shall rely on rinsing the mouth or establishing a pleasant after-taste.

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*TREATMENT OF CANCER OF THE RECTUM, WITH A REPORT OF TWENTY-FIVE CASES.**

By W. W. Keen, M.D., LL.D.,
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[*Concluded.*]

Case I.—*Resection of four inches of the rectum from a point two inches above the anus, by Kraske's method; recovery; gain in weight, about fifty pounds in nine months. Second operation thirteen months later to re-establish the continuity of the rectum; death from infective peritonitis.*

Rev. W. W. F., of Pottsville, Pa., aged sixty-one, five feet five inches, weight 168 pounds, first consulted me November 16, 1891. He had lost fifteen pounds in the last eighteen months. For two years and a half he had had trouble in his rectum, with frequent bloody stools; sometimes his stools were watery without blood. Of late there had been an almost constant desire to evacuate the bowels; occasionally the call was so urgent that he had been unable to reach a convenient place before having the evacuation. His sleep also was disturbed by it. He had moderate pain and a great sense of rectal fulness all the time. His rectum had never been examined by his physician. Rectal touch revealed a large tumor, especially marked on the anterior wall of the rectum, beginning three inches above the anus. For a week before the operation the bowels were persistently evacuated, partly by enemata, partly by laxatives, both of which were administered daily, and it seemed as though the bowel had been completely emptied.

Operation December 2, 1891. By a curved incision from the posterior inferior spine of the ilium to just posterior to the anus the bones were exposed, the rectum separated, and the coccyx and the sacrum removed at the level of the third sacral foramina. Separation from the prostate and the bladder was very easy, excepting at the level of the diseased mass, where the adhesions were quite intimate, and in loosening them the peritoneum was opened purposely and quite widely; the bowel was brought down with difficulty owing apparently to the two inferior mesenteric arteries, which acted like guy-ropes. One enlarged gland was found in the meso-rectum. During the dissection the weakened bowel gave way at several points and allowed the contents of the rectum to escape. Sponges, however, were placed in the peritoneal opening and prevented contamination. The opening in the peritoneum was not closed by suture. The diseased portion of the bowel, beginning at a point six inches above the anus and terminating at a point two inches above the anus, was resected, and the cut upper end fastened to the soft parts at the end of the resected sacrum. A long rectal tube was carried up into the colon, and the bowel was then washed out continuously for at least ten or fifteen minutes. In spite of the preliminary cleansing, the amount of material seemed to be endless. I feared to prolong the operation, which had already lasted about two hours, and so desisted from washing out the bowel before it was entirely clean. The long time consumed was probably on account of its being my first resection of the rectum by Kraske's method, and I was therefore unfamiliar with its technique. The patient stood the operation very well. The amount of blood lost was only moderate. Three drainage tubes, one on each side and one posteriorly, were used. He made a slow but satisfactory recovery, the wound filling up by granulation and closing in a month. When he got out of bed his weight was 147 pounds; three months later it had risen to 185 pounds, the heaviest weight he had ever attained, and he felt as well as he ever did in his life. By September, 1892, nine months after the operation, his weight had reached 192 pounds. No incontinence of feces existed during the night, but in the daytime he had no satisfactory control. In addition to this there was such prolapse of the bowel, often amounting to six or seven inches, that he desired if possible to have the continuity of the bowel restored.

Second operation January 19, 1893. On inserting a finger of one hand into the natural anus and a finger of the other into the artificial anus, I found that there was less than a quarter of an inch, apparently, between the two fingers. I therefore attempted to use Murphy's anastomosis button at this point by cutting a small opening with scissors, but the

* Read before the West Branch Medical Association, at Bellefonte, Pa., Jan. 12, 1897.

shank of the button was too short to allow of the penetration of the shank sufficiently to attach the two halves. Accordingly, after a somewhat persistent trial, I was obliged to abandon this method of anastomosis. I had carefully examined, as had also my colleagues, Professors Montgomery and Hearn, to see whether the peritoneal cavity was invaded by the opening just made. There being no evidence of its involvement, I drew a rope of iodoform gauze through the opening so as to keep it patent, with the intention of closing the artificial anus when the anastomosis was perfect. For two days everything went well, but on the third day his temperature rose to 101.2°, the following day to 103.2°. On the second day the iodoform gauze packing was removed and the bowel thoroughly douched with warm boiled water. There was no tenderness over the abdomen and no other symptom to indicate peritonitis until the third day, when there was very slight abdominal tenderness. His strength, however, failed rapidly and he passed into unconsciousness, dying on the fifth day. No discharge of pus had occurred from either the anal or the upper portion of the bowel.

The post-mortem showed adhesions of the coils of intestine and of the pelvic organs throughout the pelvis, and considerable pus from the site of operation upward into the sac of an old indirect inguinal hernia.

CASE II.—*Resection of six inches of the rectum by Kraske's method to a point eight inches above the anus, preceded by an inguinal colostomy (Maydl's method). Eight days required to cleanse the bowel after the colostomy. Recovery. No recurrence for four years and two months. Social and business life unhampered; good control of feces. Rides a bicycle.*

Mr. B., Philadelphia, aged thirty two, was first seen on June 10, 1892, in consultation with Dr. Wharton Sinkler and Dr. James C. Wilson. Weight in April, 1892, 175 pounds; best weight, 185 pounds. In 1876, when out camping, he lifted a heavy log, following which he had a hemorrhage from the bowels amounting to several ounces, but has had none since. No other ill effects followed, nor was he aware of anything having given way. His appetite had always been abnormally great and he indulged it without wise restraint, both as to the amount and character of his food. He had also been remarkably constipated. In the autumn of 1891 he noticed that there was considerable mucus in his stools. In December, 1891, he had an attack of grippe, for which, in January, 1892, he went to Asheville, N. C. While there he had a severe attack of pain in the hypogastrium with diarrhea, and from that time on not only was there mucus but blood was observed almost daily, never however amounting to a hemorrhage. On May 30, 1892, he had such a violent attack of obstruction that his life was endangered, but it finally yielded to treatment. Another slight attack followed soon after. Hemorrhoids were also present and were very painful and tender, so that when I saw him it was not possible to introduce the finger to any considerable extent into the bowel, and I was unable to examine the rectum thoroughly. On July 16 he was etherized and three hemorrhoids were removed by the Paquelin cautery. I took advantage during this etherization to examine the rectum higher up. The moment that the sphincter was dilated a ring of teat-like processes appeared scattered over the rectum and merged at a higher level into a mass which there was no doubt was a carcinoma. Two of these processes were twisted off and were examined by Prof. W. M. L. Coplin. He reported that while the general structure of the specimen was that of an adenoma of the rectum, yet it pointed to a rapid degenerative process and for all practical purposes, therefore, was to be considered a tubular epithelioma. As the weather was very hot and he had lost much strength in consequence of it, we did not deem it wise to make a radical operation at this time. He was therefore given a bland, liquid, nutritious diet, and later a solid diet as his stomach would assimilate it, the bowels kept loose with laxatives, and as soon as he was able he was encouraged to get up and walk out of doors.

Early in August he went to the seashore, and returned early in October weighing 168 pounds, a gain of 23 pounds in ten weeks. On October 22 he was etherized for the purpose of a thorough examination, which was participated in by Drs. Sinkler, Wilson, Robert F. Weir of New York, and Robert W. Johnson of Baltimore, as well as myself. It was found that the tumor had grown considerably in size, but was still movable and not attached to the bladder anteriorly. It was situated about four inches above the anus. The finger was passed through the lumen of the growth with difficulty, therefore it was not certain that we could reach the upper border of it.

Operation November 5, 1892. A Maydl operation was done in the left inguinal region

on this date. The sigmoid flexure had a very short mesentery. Five hours after the operation he complained of pain due to the retention of flatus from a too acute kink over the glass bar. On attempting to pull down the upper part of the colon I found that it was very adherent, so that it required considerable force to loosen it. Three days afterward the sigmoid was opened by scissors, the bar being left in place till the end of a week. For eight days after this the lower bowel was washed out every day, both from the artificial anus and the natural anus. After the first two days the return liquid was entirely clear, yet on the fifth day a large movement occurred from the natural anus, showing that considerable fecal matter still blocked up the rectum below the artificial anus. Fifteen grains of ox gall were then thrown into the lower rectum from above, which broke up and dislodged considerable fecal matter.

Operation November 16, 1892. Ether; duration of operation, two hours. Four and a half inches of the coccyx and sacrum were removed, going up to the third sacral foramen. The lower end of the spinal canal was opened and a small amount of cerebro-spinal fluid escaped. A catheter was held in the bladder to define the limits both of the bladder and of the urethra. The peritoneum was opened, as it was impossible to draw down the bowel without doing so, but was immediately fastened to the wall of the rectum by a continuous silk suture. The rectum was divided two inches above the anus and again at a point eight inches above the anus. The stump of the rectum was then attached to the end of the sacrum, two large drainage tubes were inserted, one on each side, and the anterior wound was packed with iodoform gauze. I did not suture the two ends of the bowel together—though mechanically this would have been possible—because the operation had already lasted two hours, his condition was not very good, and independent of this I was not much in favor of such anastomosis. He made a slow but sure recovery, the wound closing entirely at the end of about six weeks. The tumor was examined again by Professor Coplin and pronounced to be a tubular epithelioma.

Four years and two months have elapsed since the date of the operation. The patient has been in such good health that his weight has exceeded 200 pounds. He was abroad for over two years, traveling in various parts of Europe along the Mediterranean, in Egypt, etc., and entering freely into all his ordinary social relations. His latest achievement has been to ride a bicycle (with a Christy and not a perineal leather saddle), which he has done without any trouble. The inguinal anus has been so comfortable that he has not cared to have any attempt made to re-establish the continuity of the bowel and close the inguinal anus.

His mode of dressing the openings is as follows: First, the sacral anus: as some mucus escapes from this he applies two squares of absorbent cotton and over that a sheet of wood-wool, retaining them in place by a T-bandage. Secondly, the inguinal anus: three pads of absorbent cotton to the right, left, and below the opening, then another pad over the whole, then rubber dam, another layer of cotton, and a binder.

At times the bowel protrudes from the sacral anus from two to six inches, but he has no difficulty in replacing it. His control over his movements is good. What is curious, in view of the absolute severance of the bowel at the inguinal anus into an upper and lower part, is that about every two weeks a very small but positive fecal movement occurs from the sacral anus; evidently a small amount of the feces, which escapes from the upper colon at the inguinal anus, is forced back by the pads into the lower opening of the colon and finally escapes, as stated, through the sacral anus.

CASE III.—*Amputation of nine and a half inches of the rectum by Kraske's method, preceded by an inguinal colostomy (Maydl's method). Recovery. No recurrence after four years. Excellent control over evacuations. Social and business life unhindered. Can ride a bicycle.*

Mr. F. was kindly brought to me by Dr. H. W. Elmer, of Bridgeton, N. J., on December 14, 1892. Aged forty-six; best weight 185 pounds, present weight 152 pounds. Two years before he noticed a fissure of the anus, which was followed by hemorrhage and constant discharge. On examination I found a distinct ulcer on the left side of the anus about one inch in diameter and extending upward. From that a very widely spread carcinomatous growth extended at least three to four inches up the bowel. He also had a left oblique inguinal hernia.

Operation January 6, 1893. I did a Maydl operation in the left inguinal region, and two days later opened the bowel with the Paquelin cautery, dividing it completely in two down to the bar. I then systematically washed out the rectum and colon both from the artificial and the natural anus.

Operation January 18, 1893. Kraske's operation was done, the incision passing from the left antero-posterior spine to a point an inch in front of the anus and encircling that opening. A bougie was inserted into the bladder, and when I separated the rectum in front I found I had laid bare and recognized in the various steps of the operation the bulbous portion of the corpus spongiosum, the membranous urethra, the prostate gland, and a considerable portion of the wall of the bladder. The peritoneum was opened, but sutured soon afterwards to the anterior and lateral walls of the rectum. No enlarged glands were found. Nine and a half inches of the bowel were removed and the stump of the rectum attached to the end of the sacrum. A drainage tube posteriorly and iodoform gauze anteriorly were placed. No rise of temperature followed the first operation. After the second operation the temperature rose from the second to the fifth day to as high as 102.4°, but reached the normal on the ninth day. The stitches were all removed at the end of eight days. On the fifteenth day he sat up, and at the end of the fifth week went home. No irritation of the bladder followed.

Dr. D. Braden Kyle examined the specimen and reported that it was an epithelioma.

Present condition, December, 1896, after four years: A very moderate prolapse of the bowel takes place, especially in the summertime. When that occurs he is obliged to stop and rest. I saw him December 21, 1896, within a month of four years after the operation. His weight is 185 pounds. He is in vigorous, robust health, and has been ever since the operation. He is one of the most active business men that I know. He comes frequently to the city in the morning in order to make purchases for his several stores, and returns in the evening after a hard day's work. Ordinarily he has two voluntary movements, one at night and one in the morning. If his bowels are loose he is obliged to give very careful attention to himself, and sometimes is unable to attend to business satisfactorily. This is rarely the case, and commonly one would never know that there was anything abnormal in his person or his history. He usually defecates standing. His observations in regard to the flow of mucus from the sacral anus and his method of dressing the wound, with which he has had a good deal of experience and in which he has shown a good deal of ingenuity, are as follows:

"The amount of mucus depends altogether upon the amount of irritation, and that generally upon overexertion or temporary ill health. It is a wonderfully sympathetic part of my anatomy and is always affected by a bad cold with any accompanying coughing and sneezing, even the dynamic of nose-blowing finding a resultant there. Riding in a wagon on a rough road hurts it very much. I have tried the bicycle, but have not yet learned to ride it. I have succeeded in so arranging the pad of my bandage that all flow of mucus is absorbed, one pad lasting if necessary for twenty-four hours. The inguinal anus gives me no trouble beyond the necessary inconvenience attending the discharge of fecal matter, and that has been reduced to a minimum. Occasions of being caught so that I am obliged to run to cover are very few and far between, and it is getting to be the rule that I require no attention between rising and retiring.

"I dress the anus as follows: a thin layer of antiseptic wool, another of absorbent cotton about the size of a sheet of paper (six by ten inches), a piece of muslin of the same size, then another layer of cotton still larger, another of muslin, then a sheet of rubber dam and a bandage of heavy unbleached muslin is an absolute defense against any happening excepting genuine diarrhea, and that has to be very bad to get away with me. If a movement occurs that is formed and I can attend to it soon, frequently only the first or second layer needs to be discarded. At night there is frequently very little mucus. My truss is a powerful safety guard, holding the lower edge of the bandage tightly to my body, preventing the escape even of very thin fecal matter, and I do not see how I could get along without it even if there were no hernia. My eating habits are methodical. I make it a rule to eat stewed or raw fruit for supper and drink somewhat freely. A cup of strong coffee on getting out of bed in the morning or before brings everything down and out in good shape within an hour, and then I dress and go about my business with serene confidence."

(This observation as to the truss would suggest that in such cases a dummy truss might be used to advantage.)

His method of dressing the sacral anus is ingenious and might prove useful to others. With a view both to absorbing the mucus and preventing the prolapse of the bowel he uses an ordinary metal shoe-horn, the convex surface turned next to the skin and narrow end forward, and covered as follows: a piece of

canton flannel four by six is folded lengthwise, the corners turned, and the shoe-horn slipped in between the two folds and fastened by safety-pins; a second layer of canton flannel, then a double layer of absorbent cotton slightly wider than the flannel, and a layer of globe antiseptic wool about an inch wider than the absorbent cotton. To prevent chafing, some aristol is spread on the surface of the sterilized wool. All of these layers of cotton, wool and flannel go between the shoe-horn and the skin; the whole is then kept in place by the T-bandage already mentioned.

CASE IV.—*Five inches of rectum amputated by Kraske's method, preceded by an inguinal colostomy (Maydl's method). No return after four years. General condition satisfactory.*

Geo. M. R., aged fifty, was admitted to St. Agnes' Hospital November 15, 1892, at the instance of Dr. John J. Black of New Castle, Del. I publish the case by the kind permission of Dr. A. W. Ransley, with whom I was associated in its management. He had had dysenteric symptoms for four months. An extensive, very soft, bleeding carcinoma of the rectum was found by touch. Operation December 3, 1892. An inguinal colostomy was done by Maydl's method. The bowel was opened on the second day. Second operation December 15, 1892. Amputation of the rectum was done, the sacrum being divided transversely between the second and third sacral foramina. About five inches of the bowel were amputated, and the upper end sutured to the end of the resected spine.

Present condition: There is no indication of a return of the disease after four years. The inguinal anus does not annoy him seriously, but he is somewhat reluctant to go into society. He has on an average two movements a day, morning and evening; has no control over them, but is aware of them before they pass. There is a moderate protrusion of the bowel at the inguinal anus, two and half inches, and about three inches from the sacral anus. He is not annoyed by the amount of mucus discharged from the bowel. His general health is first-rate.

Dr. John J. Black, who kindly sent him to me at the hospital, says that "to-day he would pass for a man hale and hearty, forty years of age; eats everything and plenty of it. No irritation from abrasions of the skin."

CASE V. — *Amputation of six and a half inches of the rectum by Kraske's method, preceded by inguinal colostomy (Maydl's method); bowel not fully cleansed after seventeen days' constant washing; spinal canal opened. Recovery.*

Joseph A., aged forty-six, Altoona, Pa., entered the Jefferson Hospital October 13, 1893. His family history is good. Up to January, 1893, he had always been well, but at that time he noticed a slight amount of blood in the stools. This continued almost all the time up to his admission to the hospital. Constipation of late had been very marked; the fecal masses were diminished in diameter until they had become ribbon-like. He had very little pain, but great discomfort in the rectum; no vomiting; loss in weight fifteen pounds. On examination I found a rather slender man with a moderately cachectic look. Specific gravity of urine 1.023, no albumen, a slight trace of sugar. By rectal touch, an inch above the anus, a hard irregular mass was immediately encountered; the fingers could not be passed through it. I found also some hemorrhoids. By abdominal examination the descending colon and sigmoid flexure showed a row of irregular lumps, whether hardened feces or extension upwards of the disease I was uncertain. I advised an exploratory operation in the left iliac region to determine, first, the nature of these masses, as a differentiation between scybala and cancer could not be made by means of high injections on account of the obstruction by the disease; secondly, if they were found to be scybala, that a Maydl operation should be done immediately and the extent and character of the rectal growth be determined; thirdly, if they were found to be nodules of disease, that a right colostomy be done. Left inguinal colostomy by Madyl's method was done October 15, 1893. The hardened masses were found to be scybala. The bowel was opened twenty-four hours after the operation by a longitudinal incision by the Paquelin cautery. The bar was removed at the end of a week. From October 16, when the bowel was opened, to November 2, a period of seventeen days, the bowel was washed out both upwards and downwards toward the stomach and toward the rectum by copious enemata, sometimes of warm water and sometimes of ox gall, with the intention of absolutely cleaning out the bowel. Injections were also made from the anus, but very small amounts of fluid could be passed in in this way. I appointed the Kraske operation for the 28th of October, twelve days after the opening of the artificial anus, but on that morning, in spite of all the washing out already done, he was taken with diarrhea, during which an

immense quantity of feces poured out of the artficial anus, the oozing being almost continuous for about sixteen hours. The fecal torrent having then been arrested and the bowel apparently clean, I did the Kraske operation on November 2, 1893. The coccyx and two and a quarter inches of the sacrum were removed; the prostate and part of the bladder were uncovered in the dissection. I attempted to remove the diseased portion without opening the peritoneum, but found it impossible to get above the upper edge of the disease. Accordingly the peritoneum was opened, the rectum drawn down, and the peritoneum immediately sutured to the anterior wall of the rectum, thus closing the cavity. In order to obtain access to the rectum I found it necessary to remove three-quarters of an inch more of the sacrum, making three inches in all of the sacrum and coccyx. The spinal canal was opened by the removal of this portion of bone. When doing this, at the left edge of the coccyx I discovered a considerable area of the bone so softened that the finger-nail could easily break it down. All of this left side up to the border of the great sacro-sciatic foramen was then removed by forceps and gouge. No enlarged glands were found in the meso-rectum. The anal portion of the bowel which was normal was so small that I removed this as well as the diseased part. The portion removed measured six and a half inches. The stump of the rectum was attached at the end of the resected spine.

The hemorrhage was only moderate. Iodoform gauze was packed posteriorly and anteriorly to the rectum. The operation lasted an hour and three-quarters and the patient showed marked shock, but reacted very well. To my surprise, on the second day after the operation, in spite of all the washing out begun nineteen days before, a very large amount of fecal matter was discovered impacted in the rectum and had to be removed mechanically, after which a considerable amount was spontaneously evacuated during this and the next day. On the sixteenth day the patient sat up, and on the twenty-fifth day left for his home. His highest temperature was 102°, and the normal was reached at the end of a week. Except where the gauze drains were placed, absolute union by first intention took place. No later history has been obtainable.

CASE VI.—*Cancer of the rectum, anus, and vagina. Amputation of six inches of the rectum by Kraske's method with a* V*-shaped piece of the recto-vaginal septum, preceded by an inguinal colostomy by Maydl's method. Death in thirteen hours from shock.*

Mrs. P. M. was first seen June 10, 1893. Aged thirty; married five years, three children. Before her marriage she suffered from prolapse and retroversion of the uterus and moderate prolapse of the bowel. Two years and a half previous to my seeing her she noticed a very slight pinkish discharge from the rectum, but had no pain in defecation until sixteen months subsequently. Since that time the pain had gradually increased until it became excessively severe, keeping her in misery for a number of hours after each movement. During this same time the fecal masses had diminished in diameter until they became the size of the little finger. In December, 1892, a small portion of the growth was removed by another surgeon. The growth was at that time thought to be benign, but the microscopical examination showed it to be malignant. I etherized her in order to make a careful examination. Nothing abnormal was found in the abdomen. At the anus there was an ulcerated mass entirely surrounding the orifice, with outgrowths of an inch or more in length. The introduction of the finger showed a hard nodular growth surrounding the rectum. By some pressure the finger could be forced through the growth and detect its upper limit. The recto-vaginal wall was partly involved on its rectal aspect up to the junction of the vagina and uterus, but the mucous membrane was not involved, excepting just at and above the anus.

June 17, 1893, Maydl's operation was done. There was some difficulty in finding the colon, which was displaced far to the right. The colon was stitched at each end of the incision. The bowel was opened three days later by the Paquelin cautery, dividing it completely to the bar.

June 28. After having daily washed out the lower bowel through the artificial anus with ox gall, boiled water, boric acid, etc., a Kraske amputation of the bowel was done. In separating the soft parts from the sacrum and coccyx posteriorly I was struck with the advisability of not going too close to the bone, so that the vessels which bled freely could be caught much more easily than when they were severed very close to the sacrum.

The sacrum was resected at the level of the third sacral foramen. No enlarged glands were felt in the meso-rectum. The rectum was dissected loose chiefly by the finger, the levator ani being divided by knife and scissors. The incision was then carried around

the anus and sufficiently far into the vagina to include a generous healthy portion, as well as the diseased portion of the septum. With one finger in the vagina it was easy to ascertain the limits and relations of the diseased portion to the rectum, and a V-shaped piece was removed, its apex reaching nearly up to the uterus. The peritoneal cavity was opened, the rectum drawn down, and the peritoneum then stitched to the anterior and lateral borders of the rectum. Six inches of the rectum were amputated. The posterior wall of the vagina was now united by a continuous Lembert suture, approximating the raw outer surfaces of the vaginal wall on each side. Drainage tubes were placed at the anterior and posterior extremities of the wound, which otherwise was closed. The operation lasted nearly an hour and three-quarters. The patient was in marked shock. Before the operation she had had ¼ grain of morphine and $\frac{1}{75}$ grain of strychnine, and $\frac{3}{75}$ were administered during the operation. During the night the same medication was continued as needed, together with stimulants and external heat. Her temperature barely rose to 100°, but her pulse never became perceptible, and she died suddenly at 3 A.M. apparently from heart clot, thirteen hours after completion of operation.

CASE VII.—*Cancer of rectum. Five inches of the rectum removed from four to nine inches above the anus by Kraske's operation without prior colostomy. Death after fifty-six hours from uremia.*

Samuel S., aged forty-one, was sent to the Jefferson Hospital by Dr. Stahren March 12, 1896. Family history excellent. He was a moderate drinker; denied syphilis. A year previous he observed a burning sensation in the rectum during defecation. This increased in severity till it became quite painful. After a considerable time he began to pass bloody stools, lost his appetite, and not infrequently had nausea and vomiting. The bowels alternated between constipation and diarrhea. He had lost about ten pounds in weight. On admission his temperature was 97.6°; pulse 98, full and of high tension. The arterial coats were markedly thickened; aortic sounds slightly accentuated. Urine 1.022, no albumen or sugar; urea 2.2 per cent. About three inches above the anus an indurated ulcerated tumor was felt involving the entire circumference of the rectum and constricting it.

Operation March 18, 1896. Owing to his diseased arteries I hastened the operation as much as was possible, and finished it in an hour and a quarter. Four and a half inches of the coccyx and sacrum were resected to the level of the third sacral foramen. The rectum was separated from the adjacent parts without difficulty. The disease began about four inches above the anus, and the part resected was five inches long. No glands were felt in the meso-rectum. The peritoneum was opened and immediately fastened to the peritoneal surface of the rectum. The stump of the rectum was then fastened at the end of the resected sacrum. The wound became smeared from the fecal matter which was discharged from above the disease, but great care was taken to prevent infection by packing one part of the wound with iodoform gauze while working at another part, and by careful washing with bichloride of mercury afterward. Only about a dozen ligatures were needed. An iodoform gauze drain was passed through the anal segment and the anus, another behind the normal anus, and a third was pushed up into the bowel so as to prevent any fecal infection. It was not possible to approximate the two ends so as to restore the continuity of the bowel. During the night after the operation the temperature rose to 100° and he became delirious, with also a very marked diminution in the amount of urine. In the first twenty-four hours after the operation he only secreted 13½ ounces of urine; in the second twenty-four hours only 3½ ounces; and in the next eight hours, at the end of which time he died, no urine whatever was secreted. By an unfortunate misunderstanding the urine was not examined. Every means were taken to increase the action of the kidneys, but he died from uremia in spite of them. Dr. Kyle reported that the specimen showed the growth to be a tubular epithelioma.

CASE VIII.—*Amputation of two and a half inches of the rectum by the perineal route, with removal of the coccyx (Kocher's method), but no prior colostomy. Artificial sphincter attempted by Gersuny's method followed by infection. Recovery.*

Mrs. B., Vinemont, Pa., aged forty, was admitted to the Jefferson Hospital February 13, 1894. Her mother died of tubercular laryngitis. There is no family history of cancer. For two years she had a sense of rectal bearing down and tension, and occasionally passed blood by the bowel. The pain in the rectum was more severe after exercise. The bowel movements were obstructed. She had no nausea or vomiting, but had lost weight till she now weighed only 103 pounds. Urine normal.

On examining the rectum I found a very distinct nodular growth which began at the anus, but extended only an inch above it. I therefore did no preliminary colostomy, but on February 16, 1894, proceeded to the amputation of two and a half inches of the bowel. The coccyx was removed and the rectum rapidly detached both from the bones behind and the vagina in front. One enlarged gland was found in the post-rectal space. The peritoneum was exposed, but not opened. In this case, in order to obtain an artificial sphincter, I adopted the method of Gersuny, twisting the bowel 270 degrees until there was considerable resistance to the introduction of my finger. It was then sutured to the surrounding skin. Two days after the operation her temperature rose to 102°; the packing which had been put at the anterior extremity of the wound was removed, and I found that feces had escaped in the intervals between the stitches and infected the wound. One stitch was cut to allow of more efficient drainage and the parts then washed out carefully. After this she made a very good recovery and went home March 8, 1894. Dr. D. Braden Kyle reported that it was an epithelioma. I have written to her since then, but have received no reply.

CASE IX.—*Amputation of three inches of the rectum by Kocher's method. Recovery.*

M. D. K. entered the Jefferson Hospital February 14, 1893. Up to 1878 he had been in good health. He was an enlisted soldier at that time and much exposed to the weather, and suffered much from diarrhea and hemorrhoids. The latter were operated on in the post hospital October, 1878, and several times since then. He, however, was never free from the hemorrhoidal trouble, and finally was discharged from the service in 1891. In March, 1892, the hemorrhoids were again operated on, but he has never been well since. He suffered from a constant burning pain in the rectum, and passed at times small amounts of clotted blood. Defecation was very painful; there was no trouble with the urinary organs. On examination a considerable ulcerated surface was seen and felt surrounding the anus, with a mass of infiltrated and hard nodular tissue extending two inches up the rectum. The slightest manipulation caused bleeding.

Operation March 1, 1893. Three inches of the rectum were amputated and the stump attached to the skin of the perineum. The coccyx was removed to give access to the mass, but none of the sacrum. The peritoneal cavity was not opened. The wound healed by first intention, the stitches being removed in a week. The highest temperature was 102°. Three weeks after the operation he went home entirely well. No later history has been obtainable.

CASE X.—*Amputation of four inches of the rectum by the perineal route without prior colostomy. Recovery.*

Mrs. X. The notes of this case are unfortunately lost, and I can only give a meagre outline. The case was one of carcinoma of the rectum involving the anus, which I operated on in the Jefferson Hospital in 1890. About four inches of the rectum were resected without removing the coccyx or opening the peritoneum. The patient made a prompt recovery. Of her condition since then I have been unable to learn anything.

CASE XI.—*Amputation of three inches of the rectum by the perineal route; recovery. General health and business activity entirely restored. No return in four years, when he died from an acute diarrhea.*

Mr. McK., aged fifty-four, was seen in consultation with Dr. H. G. Hill February 1, 1891. Prior to seeing Dr. Hill he had thought he had hemorrhoids for some years. On examination Dr. Hill immediately detected the growth—epithelioma of the anus and rectum for two and a half inches.

Operation February 6, 1891. Three inches of the lower end of the bowel were amputated, the peritoneum not being opened. No bone was removed. A sound in the bladder was useful as a guide. The end of the bowel was sutured to the skin, a drainage tube being introduced on each side of the ischio-rectal fossa and retained for three days; highest temperature 101°, which was not as high as it sometimes had been before the operation; primary union, except at a very small point at the anterior portion of the wound.

Final result: He had very good control over the contents of the rectum except when the bowels were loose, which did not occur often. He gained in weight and his general health was excellent, so that he attended to an active business, but suffered from repeated attacks of tic douloureux. I saw him occasionally for two or three years.

January 25, 1895. I have just learned that he died a few days ago of acute diarrhea under the care of a homeopathic physician. There was no return of the disease so far as I could learn, although there was only lacking a month of four years since the operation.

CASE XII.—*Amputation of two and a half inches of the rectum and anus by the perineal route. Recovery.*

B. R, aged forty-three, entered the Jefferson Hospital March 2, 1891. Family history good. For fourteen months he had had severe pain in defecation. Operation March 5, 1891, two and a half inches of the rectum were amputated, including the anus. The peritoneum was not opened. The end of the bowel was sutured to the perineum. Healing by first intention. A recent letter has been returned with information that he is probably dead.

CASE XIII.—*Amputation of five inches of the rectum by the perineal route without prior colostomy. Peritoneal cavity not opened. Artificial sphincter by Gersuny's method followed by infection. Recovery.*

Mr. R., aged thirty-three, Philadelphia, Pa., was admitted to the Jefferson Hospital May 22, 1894. Family history good. Ten years previously he had malaria and dysentery, and three years later gonorrhea. Four years previous to admission he received a bad bruise in the region of the anus by sitting down upon the knob of a faucet. A year prior to this accident he noticed that his stools were gradually becoming smaller in diameter, and once in a while he noticed clots of dark blood and mucus, all of which were attributed to hemorrhoids. The pain in defecation gradually increased. Within the last year the fecal masses had been reduced to the size of a lead pencil, and he had had alternate constipation and diarrhea. On examination I found a well nourished and apparently healthy man, with a fair appetite, suffering no pain excepting on defecation. By rectal touch an evidently malignant growth was felt, beginning just within the anus and at a point two and a half inches above the anus; the stricture was so tight as not to be permeable by the finger. Urine negative. For a week he was in bed, during which time the bowels were carefully evacuated and his diet regulated.

Operation May 24, 1894. An elliptical incision was made around the anus, extending posteriorly to the tip of the coccyx. The rectum was then separated partly by scissors and partly by blunt dissection until healthy tissue was reached. The dissection was very difficult on account of the adhesions, but was facilitated by splitting the rectum and carrying the left forefinger up into the gut. It was not necessary to remove the coccyx. In the anterior part of the wound were disclosed the bulb of the corpus spongiosum, all of the prostate gland, and a considerable portion of the bladder. Although five inches of the rectum were resected the peritoneal cavity was not opened. The stump was twisted 180 degrees and fastened to the skin by very close stitches. In front of the rectum and behind it gauze packing was inserted. The calibre of the rectum itself was also packed with a considerable pledget of iodoform gauze to prevent the escape of fecal matter and infection. The stitches gave way and infection of the wound took place. The temperature, which up to that time had been about 100°, on the twelfth day rose to 102.4°, but fell to the normal in two days. He was discharged from the hospital on July 3, the entire wound being healed excepting a small sinus in front of the anus.

March 1, 1897. Two years and ten months have now elapsed since the operation, and he writes me that there is no evidence of any recurrence, that he has "fair control over his movements and always has warning at time of stool, of which he has about two or three a day." There is no protrusion of the bowel and only a trifling mucous discharge. His general health is excellent.

CASE XIV.—*Cancer of anus and rectum. Removal of* V*-shaped portion of bowel, including the sphincter, by the perineal route. Recovery.*

Joseph N., aged twenty-nine, was admitted to the Jefferson Hospital March 10, 1896. His family history is good. Two years prior to admission he had a fistula *in ano*, which was operated on, but left an ulcer which never healed. On examination I found a very marked indurated chronic ulcer of the rectum just within and partly involving the sphincter in the median line posteriorly.

Operation March 11, 1896. I removed a V-shaped portion of the anus and rectum, the apex of the V being an inch and three-quarters from the anal margin. The portion of the sphincter excised was nearly an inch. The mucous membrane was stitched together, special care being taken to see that the ends of the sphincter muscle also were well approximated. Before the operation a tampon of iodoform gauze was pushed up into the rectum to keep the wound clean, and was left there for three days after the operation. A small amount of opium was given daily to constipate. March 30, 1896, he was discharged almost well. The sutures had cut out to a small extent and produced a little local raw surface. He is still living.

Dr. D. Braden Kyle examined the specimen and pronounced it a squamous-celled epithelioma.

CASE XV.— *Resection of four inches of the rectum and sigmoid flexure by abdominal section. Approximation by Murphy's button only partially practicable by reason of the silk thread catching in the thread of the screw. Appendix also removed. Sloughing of the bowel. Death on the third day.*

Mrs. W., aged thirty-three, was kindly sent to the Jefferson Hospital by Dr. Vaughan, of Middletown, Del., November 19, 1894. Her maternal grandfather died of cancer of the stomach; otherwise her family history was good. She had not lost weight. She always enjoyed good health till September 1, 1894, when she had an attack of cholera morbus. This was followed by what was thought to be an appendical abscess, as she passed considerable pus by the rectum. She had been very much constipated ever since, and for two weeks had no movement of the bowels. There had been considerable nausea and vomiting, not fecal in character. She suffered from much flatulence and tenderness, especially in the right iliac fossa. Her temperature had been normal or even subnormal constantly, excepting for two days, when it rose to 100.6°.

A careful examination of the rectum gave no information. The abdominal wall was so thin that the coils of intestine and their active peristalsis were easily seen. No tumor could be discovered anywhere. Various purgatives and enemata were tried for ten days in order to unload the bowels; high enemata were then used by Hegar's method. The largest amount which could be injected was a quart; more than this caused considerable pain. This however at last enabled me to discover the source of the trouble. The enema by this method with the pelvis raised forced from the pelvis into the abdomen a lump about two inches in diameter. The tumor was movable; it was just above and to the left of the pubes. By various means the bowels were gradually unloaded, but the tumor still remained.

Operation December 7, 1894. In view of my ability to displace the tumor from the pelvis into the abdomen, I determined to operate by way of the abdomen. This was opened in the middle line and the appendix first explored. This was found to be nearly five inches long, very much twisted, and completely filled from one end to the other with a row of oval fecal concretions. Deeming this a very probable future danger the appendix was removed. The sigmoid flexure was very long, the loop reaching over to the right iliac fossa; its walls seemed to be markedly thickened. Passing the hand into the pelvic cavity I was able to draw out the tumor already alluded to. This was a puckered mass on the anterior side of the colon and was so low down that it was with great difficulty that it could be drawn out of the pelvis sufficiently for operation. Below the tumor, the sigmoid and rectum were narrowed, but from the tumor upward for about fifteen inches the whole of the descending colon and the sigmoid flexure were thickened, especially at the longitudinal bands. I was quite uncertain whether the whole mass was cancerous or whether the thickening might not result from the former inflammatory attack, but as I found the mesenteric glands enlarged I thought it wise to excise the tumor and the adjacent most markedly diseased colon. Four inches of the bowel therefore, including the nodular mass, were resected, a small V-shaped portion of the mesentery being taken out, the apex of which was only about an inch from the colon, and an end-to-end anastomosis was then effected by a Murphy button. The lower half of this fitted into the calibre of the bowel rather snugly, but the upper end of the bowel was so dilated and thickened that there was great difficulty in inverting the end satisfactorily. Moreover, when I attempted to approximate the two halves of the button, after they had approached each other about half the proper distance, I found that I could not approximate them any further. Accordingly, I surrounded the button with two rows of Cushing's right-angled sutures. Dr. D. Braden Kyle, to whom the specimen was given for examination, reported that it was a tubular epithelioma.

Immediately after the operation fecal movements began. In the first twenty-four hours she had nine, not diarrheal, but of soft feces, and in the next twenty-four hours there were seven movements, and a few more afterwards. On the evening of the second day when I saw her she was bright and cheerful, her temperature was normal, her stomach had quieted entirely, and there was no pain. At 10 P.M. she was suddenly seized with violent abdominal pain, passed into collapse, and died at 10 A.M. on the third day.

The autopsy showed that the stitches had held, but that an inch and a half of the upper dilated end of the bowel had sloughed

and caused perforation. On removing the button I found the obstacle to complete approximation of the two halves lay in the fact that one end of the silk ligature around the collar of the button had been caught between the two tubes as one was thrust into the other, and when it was drawn taut no further approximation of the halves could be made.

Abbe (*Annals of Surgery*, January, 1895, p. 71) has reported a similar case. The unexpected difficulty that I had points to the fact that we ought to see that the two ends of the silk are cut short enough not to catch in the thread of the screw.

CASE XVI.—*Inoperable carcinoma of rectum. Lumbar colostomy. Death in about two years.*

John W. F., of Washington, D. C., was first seen at the request of Dr. S. Weir Mitchell June 8, 1885. Six weeks before he thought he had piles, as a small amount of blood was seen in his movements. The fecal masses were of good size. He had bearing down pains, especially marked in the sacral region, with a sense of fulness in the rectum, though there was little or no pain. Four inches above the anus posteriorly a tumor was felt. It stretched two-thirds around the rectum and was firmly attached to the sacrum; was hard, irregular, and nodulated. I regarded the case then as inoperable. In about five months the cancerous circle was completed. A year later a lumbar colostomy was done by another surgeon. This relieved him greatly. He died about two years later.

CASE XVII.—*Inoperable cancer of the sigmoid and rectum. Right lumbar colostomy. Peritoneum opened; great difficulty in deciding upon which was the colon and which the small intestine. Operative recovery; death about a year later.*

Mrs. W., aged sixty, wife of a physician living in Minnesota, consulted me in the winter of 1887. She had suffered for nearly a year with constipation and diarrhea, with diminished fecal masses and a great deal of pain in the left inguinal and sacral regions. She had lost considerably in weight. The instant that the fingers were placed upon the left lower abdomen, just at the upper border of the pelvis, a long sausage-shaped tumor was found, the lower end of which was lost in the pelvis, the upper end reaching a little above the anterior superior spine. By the rectum the finger could just touch the lower border of the growth. The diagnosis was evident and no radical operation possible. Accordingly, I did upon her a lumbar colostomy, in the right lumbar region. I was unable to find the colon without opening the peritoneum. When I opened it two coils of intestine presented themselves. I was utterly unable to distinguish at first which was the colon and which the small intestine. I was unable to recognize any longitudinal bands in the colon *in situ*, and the colon could not be drawn out sufficiently to enable me to see them. Finally, as the result proved, I decided on the right one, more I am bound to say by good luck than by good judgment. She died about a year later. The difficulty which I had in this case decided me positively, therefore, to abandon lumbar for inguinal colostomy. In addition to this the advantages of inguinal colostomy, which I think are very many, almost decided me independent of the difficulties experienced in this case.

CASE XVIII.—*Inoperable cancer of the rectum. Lumbar colostomy. Recovery. Death twenty-four days after operation from acute entero-colitis.*

George C., aged forty, Beverly, N. J., was kindly referred to me at the Jefferson Hospital by Dr. J. B. Walker, of Philadelphia, on May 11, 1891. Best weight 169 pounds, in August, 1890; present weight 137 pounds. His history showed chronic constipation. In August, 1890, he consulted a physician, who said that he had trouble in the sigmoid flexure. When Dr. Walker first saw him just prior to his admission to the hospital he discovered a lump at that point. The tumor was the seat of a dull ache, with shooting pains down the left leg.

On examination a tumor was felt in the left iliac fossa, and when the finger was passed into the rectum the tumor was felt about two and a half inches above the anus; reciprocal pressure could be felt both above and below. The disease being so very extensive I deemed it inoperable and advised a left lumbar colostomy. This was done on May 26. The bowel was not opened for three days, as there was nothing urgent about the case. He left the hospital June 5 entirely recovered. A very sudden change of the weather took place the day he left the hospital, and he apparently took cold, fell severely ill of an entero-colitis, and died two weeks later.

CASE XIX.—*Inoperable cancer of the rectum. Inguinal colostomy by Maydl's method. Bowel opened in six hours; great relief. Death from exhaustion thirty-one days after the operation.*

Miss C. B. was seen in consultation with Dr. G. R. Morehouse February 17, 1893. There had been absolute obstruction for

eleven days, excepting that the enemata used had brought away small masses of fecal matter. The abdomen was so much distended as to interfere with respiration, and there was every evidence of impending speedy dissolution. A small bed-sore existed over the sacrum, and the patient was emaciated to the last degree. Rectal touch showed that the rectum was full of solid feces, and the tip of the finger discovered a cancerous mass. As she had no power to expel the contents of the rectum they were removed piecemeal by the finger and a spoon-handle. This being done, the hard mass was felt as a nodular growth, the mouth of which was so softened that the disease could be broken down by the finger-nail. Evidently radical treatment by excision could not be entertained for a moment; a palliative operation would be all that could be done. Accordingly, the same day a Maydl operation in the left iliac fossa was done in a very few minutes. Six hours after the operation the bowel was opened with the Paquelin cautery without hemorrhage. The adhesions were perfect. Small quantities of gas and feces were passed in the next twenty-four hours, with great relief. The subsequent comfort that she had entirely warranted the operation. Two weeks after the operation I removed the glass bar and tied the mesenteric portion of the bowel by a rubber band. Forty-eight hours later I completed the division by the scissors. The feces between the artificial anus and the rectal tumor were partly voided through the artificial anus, but most of them mechanically by the finger. Her strength failed gradually, and she died from exhaustion March 20, thirty-one days after the operation.

CASE XX.—*Extensive carcinoma of rectum and colon. Palliative right inguinal colostomy (Maydl's method). Recovery from operation. Death from exhaustion fifteen days later.*

Mrs. D., aged forty-four, was sent to the Jefferson Hospital January 15, 1895, by Dr. R. Wallace of East Bray, Clarion Co., Pa. She ceased menstruating one year prior to this date; was always in good health until two years before, when she had what was thought to be a fissure of the anus. On dilating this, a stricture of the rectum was found. Her health had gradually failed, and in the last two months she lost eight to nine pounds; color sallow; appetite poor; pain on defecation intense and continuous. The pain extended over the entire sacral region. On examination I found that as far as the finger could reach there was an extensive carcinoma of the entire bowel, involving the whole of the recto-vaginal septum, but not the vagina itself. Abdominal palpation revealed no tumor. Her general health was so poor and the disease so extensive that I very quickly made up my mind that nothing could be done excepting in the way of palliation. Accordingly, on January 23, 1895, I opened the abdomen in the left region to determine whether the colon was healthy, and if so to make an artificial anus by Maydl's method. As soon as the cavity was opened I found that the descending colon was studded with growths of a size somewhat smaller and larger than a pea. The wound was immediately closed and the abdomen opened on the right side, where the Maydl operation was done. Three days later the bowel was opened transversely to one-third of its circumference by scissors, and some vessels tied. A week later the glass bar was released by cutting through the remaining portion of the bowel. My object in waiting a week was to allow of such firm adhesions that there would be no danger of the bowel falling back into the abdomen. The operation gave her great relief, but her strength failed very rapidly, and she died on February 7, 1895, fifteen days after the operation. Before the operation her temperature had risen to 103.2°, but immediately afterward fell to 100° and below. I made some cultures from the abdominal cavity, and these Dr. Kyle reported showed both staphylococcus and the bacillus coli communis, though there was no suppuration either before or after the operation. The infection may have been an accidental one at the time of operation, but every possible means were taken to prevent it.

CASE XXI.—*Inoperable carcinoma involving the caput coli, ileum, sigmoid flexure, and rectum. Celiotomy. Artificial anus made in the ileum by Maydl's method gave relief and lowered the fever. Death on fifth day.*

Mrs. G. B. R. was first seen in consultation with Dr. Eleanor C. Jones March 20, 1896. Aged thirty-seven; present weight 95 pounds; best weight 110 pounds two years ago. Her family history was excellent. On September 1, 1895, she first observed distinct pain in the rectum. In the course of a couple of months she observed that the feces were streaked with blood. No diminution in the size of the fecal masses had been observed. On October 30, 1895, she was examined by Dr. Broomall and Dr. Jones together, and they observed nothing abnormal in the rectum. On March 9, 1896, she had been etherized by Dr. Jones and a small tumor found on the an-

terior wall of the rectum just within reach of the finger. Scrapings from this were taken, and Dr. Robert Formad reported them to be carcinomatous, which report was confirmed by Dr. Kyle. Dr. Jones had examined her blood and found the hemoglobin to be sixty per cent., and that no plasmodium existed. The urine was negative, and both urine and stools were free from tubercle, as also were her lungs.

Examination March 20, 1896. I found a rather slender and feeble looking, though sprightly, woman. The rectal tumor alluded to was readily found on the anterior wall of the rectum just above the upper end of the vagina. It was quite tender to the touch, and no satisfactory examination could be made as to its size or its relation to the uterus or the ovaries. On examining the abdomen another small lump as large as a large cherry was felt just below the right border of the ribs in the nipple line. Pressure by the finger appeared to locate it in the abdominal wall, though it might have been more deeply situated. She was then etherized. The rectal tumor extended into the pelvis and was evidently a carcinoma; I could just reach it with my finger on deeply depressing the perineum. By bimanual examination it seemed to be continuous with the uterus, and I judged that the two were adherent. She absolutely demanded an operation, preferring to take the chances of dying to living the wretched life that she had before her. I decided therefore to operate after building her up as much as possible.

Operation April 10, 1896. The last mandate that she gave me as I left her room before the etherization was: "Mind that you take it all out." A celiotomy was done in the median line below the umbilicus. I found a mass two-thirds the size of a fist uniting the caput coli, the lower part of the ileum, a coil of the sigmoid flexure of the colon, and still lower down the rectum. On its surface ran the appendix four inches long, but about twice the normal diameter. The tumor did not encroach seriously on the calibre of the bowel. It lay immediately behind the uterus, but was not adherent to it. Both ovaries were markedly sclerotic and cystic. Removal of the mass was utterly out of the question. Accordingly I made an artificial anus in the lower ileum about twelve inches from the caput coli by Maydl's method. Before doing this, however, I examined the tumor felt at the border of the ribs and discovered that it was a distended gall-bladder, and that there was a stone as large as the last joint of the thumb in the cystic duct. As it gave her no trouble and her life would evidently be short I did nothing with it. A coil of the ileum was now drawn out and the skin stitched together through a hole in the mesentery after the recommendation of Bidwell (*Lancet*, 1895, ii, 753). On the third day after the operation the intestine was opened, and this gave her great relief. Her strength however failed, and she died five days after the operation. Prior to the operation her temperature had risen as high as 102.4°, but after it and until just before her death it never rose above 100°.

Case XXII.—*Cancer of rectum. Palliative colostomy only, on account of cardiac and costal complications. Schleich's fluid used instead of ether. Recovery.*

Hiram F., aged sixty-five, was kindly referred to the Jefferson Hospital by Dr. C. H. Shivers, of Haddonfield, N. J., March 1, 1896. Family and personal history excellent, except that when in the army in 1861 he had some vague heart trouble and had never been able to do any heavy work since, nor for the last fifteen years had he done any work. A year before he noticed a burning sensation about the rectum, which gave him great pain after defecation. He had lost about twenty pounds in weight in two years. Two and a half inches above the sphincter an indurated cancerous mass was found entirely surrounding the rectum. The case was one eminently fitted for extirpation, probably without any resection of the bones except possibly of the coccyx; but I decided on a colostomy by Maydl's method, for the following reasons: first, his heart was almost certainly fatty, as was determined by Dr. J. C. Wilson, who kindly saw him with me; second, his pulse was very weak and intermittent; third, the cartilages of the ribs were entirely ossified and the lower ribs united to each other, so that the chest-wall moved very imperfectly, and only as a whole up and down and to a slight extent. This greatly interfered with his respiration.

Operation March 4, 1896. For the reasons given above I also disliked to use ether or chloroform, and accordingly used Schleich's fluid, which only answered moderately well, dulling the pain but not annulling it. He felt pain not only during the incision of the abdominal wall, but also when the colon was handled. Instead of a glass bar I sewed the skin together by two stitches as suggested by Bidwell (*vide supra*). On the second day after

the operation the bowel was opened through half its circumference, and on the ninth day was completely divided. He had no rise of temperature after the operation. I have not heard from him since.

CASE XXIII.—*Cancer of rectum. Palliative colostomy by Maydl's method only, on account of the condition of the blood. Schleich's fluid used instead of ether. Relief; recovery from operation. Death thirty-seven days later from gangrene of foot from femoral venous thrombosis.*

Mrs. C. E., Stroudsburg, Pa., aged forty-three, was kindly brought to me by Dr. B. F. Keller of Pottstown, Pa., and Dr. C. M. Brownell of Stroudsburg, October 14, 1895. Her mother died of cancer and her grandmother of a tumor presumably malignant. In the middle of July, 1895, she noticed a sore feeling low down in the back, and that it hurt her to sit down. Her passages lessened in amount, but increased in frequency to two or three times a day. The size of the fecal masses also was diminished. There was a slight mucous discharge from the anus. Rectal touch showed the rectum to be entirely surrounded by an extensive cancerous mass at two and a half to three inches above the anus. The finger could be engaged within the mass, but I was uncertain whether it reached its upper edge. No adhesions seemed to exist either to the uterus, vagina, or sacrum. Her general health seemed quite good, and I recommended extirpation. On November 7, 1895, she came down to my hospital, but with a marked change in her condition. Her lips and fingers were blue and livid, though there was no cardiac disease. Both legs were much swollen, and on examination I found a large thrombus in the right femoral vein and a moderate one in the left. In view, therefore, of the state of her blood, which became thrombosed with such ease, I instantly decided against any radical operation, and recommended a Maydl operation by a local anesthetic with Schleich's fluid.

Operation November 9, 1895. Two ounces of the medium solution of Schleich were injected under the skin and then into the muscular tissues of the abdominal wall. The operation was attended by no pain excepting at the upper end of the incision for perhaps a quarter of an inch, where I got beyond the area of the anesthesia. No pain was manifested on manipulating the colon (none of the fluid had reached the abdominal cavity or contents), and the operation was completed without difficulty, the bowel being stitched to the abdominal wall at the upper and lower margins by one suture. Two days afterward the bowel was opened with the scissors without pain or bleeding. On the fifth day the protruding part of the colon was cut away, so that the end projected only half an inch above the level of the skin. On the evening of that day she was suddenly seized with great pain in the right leg, which became pale and cold, evidently from a marked extension of the thrombus. The temperature rose to 102°. The leg was elevated, wrapped in flannel and cotton, and surrounded with hot fomentations and hot-water bags. Internally hot stimulants and tonics were administered. In four days the temperature had fallen to the normal, and she went home ten days after the operation. Shortly after leaving the hospital gangrene of the left foot set in, and she died December 16, 1895, thirty-seven days after the Maydl operation.

Through the courtesy of Dr. Wm. J. Taylor I append two other cases in which the palliative Maydl operation gave great relief: the one for a short time before death; in the other the patient's life was prolonged for three years.

CASE XXIV.—*Inoperable carcinoma of the bowel. Inguinal colostomy (Maydl's operation); great relief. Death two months later.*

Mr. P., Philadelphia, was first seen by me in consultation with Dr. Willard on May 21, 1895. For a long time he had been suffering with, as he supposed, hemorrhoids, but which proved eventually to be carcinoma of the rectum. When Dr. Willard first saw him it had gone beyond the point of successful operation, and accordingly, on May 22d, he curetted the growth in the rectum in order to overcome the obstruction, which was pronounced and painful. Following this, on several occasions I learned that curetting was done, each time with relief, the degree of which gradually lessened with the progress of the disease. In the summer of 1896, while at the seashore he came under the professional care of Dr. Wm. J. Taylor, who on September 1 did a Maydl operation in the left inguinal region, after which he made a very speedy and satisfactory operative recovery. The bowel was opened after fourteen hours. After he returned to the city I saw him on several occasions. The relief from the operation was very great. His strength gradually failed, and he died on November 6, 1896.

CASE XXV.—*Inoperable cancer of rectum. Inguinal colostomy (Maydl's method); great relief for three years till he died.*

Rev. Mr. D., aged sixty-six, had been treated for hemorrhoids for several years. For fifteen months past the stools had been streaked with blood. A very extensive cancerous growth in the rectum was discovered by touch on his first visit, October 15, 1892.

Operation October 19, 1892, by Dr. Wm. J. Taylor. He took ether with very great difficulty and required artificial respiration during the operation, which was rapidly performed. Several hard cancerous nodules were found in the descending colon. The bowel was opened on the seventh day by the cautery. He made a prompt and satisfactory recovery. No radical operation, of course, was attempted. Two years after the colostomy his general health was good, and he reported "not much trouble from the wounds." He died September 29, 1895, almost three years after the operation. Some time before his death the cancer, which had extended to the bladder, resulted in a recto-vesical fistula.

ETHER AND CHLOROFORM.

In a letter to the editor of the *Journal of the American Medical Association* of January 16, 1897, Dr. CHENERY of Boston says that a few weeks ago he saw an article stating that a number of deaths by chloroform had occurred in women in confinement. Not long before he saw it stated that no such case is on record. Now, which of these writers is correct? Has chloroform killed any woman under such circumstances? Chenery has no remembrance of seeing such an instance reported. If both ether and chloroform cause death in such cases we must select accordingly.

There are several points, however, we may properly consider as between the two:

1. An etherized patient, unless thoroughly under its influence, must be regarded as drunk or crazy, requiring considerable assistance to control and take care of her. It is not so with chloroform; the patient rather likes it and will call for it when not given to full anesthesia, and is able to think and talk and help the physician. The assistance of the nurse and one other woman is all the help required. He puts the chloroform on the handkerchief and keeps watch of the patient. The whole apparatus required is a lady's pocket-handkerchief, folded as it comes to hand, and a small phial, having a small neck, for the chloroform. Then placing the kerchief firmly over the mouth of the phial, the bottle is inverted so that only a few drops escape on to the kerchief. This bottle he keeps within reach and handles himself, using his left hand and removing and inserting the cork with his teeth. Thus any woman can hold the chloroform to the patient, returning the kerchief to him for renewal of the chloroform just preceding the next pain, and keeping the kerchief to the nose in the intervals of the pains. Thus more or less of the anesthetic can be used as the exigency requires to keep the pains bearable. If more chloroform has to be given during the last few pains that does not seriously affect the child. And even in instrumental cases it is rare to need any extra skilled help, for by the time this is reached the woman giving the chloroform has become quite competent to give the anesthetic herself.

2. In heart cases chloroform has the advantage over ether.

3. Chloroform is not so dangerous to the child, since the mother takes less of it to make her confinement comfortable, and the child is rarely but slightly anesthetized as compared with ether, and speedily, in most cases, responds to changed circumstances and begins to breathe. Even in the heavier anesthesia of instrumental cases, the time being short, there is usually little difficulty in bringing about respiration in the child, if the chloroform is laid aside and the cord is not cut. Chenery remembers but one child over which he worked many minutes before respiration was established. This mother was a particularly nervous woman and required considerable anesthesia, and it was continued a much longer time than usual. When Chenery hears of a stillbirth, the child being alive before, he always inquires if the mother did not take ether at the confinement, and this is generally answered in the affirmative.

4. Ether, by its greater stimulation of the circulation, he believes is much more liable than chloroform to be followed by hemorrhage.

Chenery thinks these four points are greatly on the side of chloroform. If it is safer for the mother it becomes almost imperative that the accoucheur should give it instead of ether in confinement cases; for if judiciously administered it is a most glorious blessing to suffering humanity. Etherization is a home invention, and the writer entered Harvard only a few years after its first application, and has witnessed the continuous prejudice in its favor ever since. Yet from his own judgment and experience he is strongly in favor of chloroform in confinement cases, and from its easy application he believes we ought not to hesitate to use it when we should be slow to begin with ether.

The Therapeutic Gazette

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THE VALUE AND DANGER OF CANTHARIDES.

It has been our custom from time to time to point out in the editorial and progress columns of the THERAPEUTIC GAZETTE certain of the untoward effects produced by drugs which are commonly employed. Thus our readers will remember that in one editorial we called attention to some of the peculiar and disagreeable influences exercised in susceptible persons by quinine, and in another editorial those caused by iodide of potassium.

In the case of cantharides, a drug which is employed so frequently, it is of importance to recognize the fact that it not only possesses much power for good but also, in persons with easily irritated kidneys, the possibilities of producing deleterious effects not only when it is administered internally by a dermatologist for certain skin lesions and by the ordinary clinician for certain low grade inflammatory processes in the kidney, but also when it is applied externally for the purpose of producing counter-irritation and vesication. Whatever may be the opinion of the best therapeutists as to the value of cantharides in minute doses for controlling or overcoming albuminuria due to subacute or chronic parenchymatous nephritis, there can be no doubt in the minds of the majority of physicians that the external use of this drug over the renal region in cases of congestion of the kidneys is often followed by the most beneficial results. Personally the writer of this editorial is convinced that the internal use of cantharides for the relief of albuminuria is resorted to too infrequently, since in quite a large number of cases he has seen beneficial results follow its employment; nor is he alone in this conclusion, for some of the English therapeutists have gone so far as to recommend minute doses of the tincture of cantharides for hematuria depending upon acute inflammation of the kidney after the first blush of its severity has passed by. Quite recently Du Cazal in one of the French journals has strongly supported this use of cantharides, having followed the recommendation made by Lancereaux in employing this method. Out of five cases, all of which followed attacks of infectious diseases, such as pneumonia and scarlet fever, four entirely recovered from the albuminuria. As pointed out, however, by Saundby in the *Birmingham Medical Review*, the results of Du Cazal are by no means as positively favorable as they would appear at first glance, for in many instances persons suffering from the albuminuria due to the infectious diseases recover without treatment, provided ordinary care is taken as to hygienic living, diet, and protection from cold. Saundby, on the other hand, states that he tried cantharides systematically in cases of nephritis some years ago, and came to the conclusion that it exercised no specific effect in controlling the excretion of albumen.

In regard to the possibility of deleterious influences following the employment of cantharides externally, a case which has recently been reported by Huchard is of considerable interest. It was that of a girl of eighteen to whose epigastrium was applied a small blister six square centimeters in size. As a result of this she developed an acute nephritis, with anasarca, intense dyspnea, convulsions, and almost complete uremic amaurosis, and associated with these symptoms she also had almost complete suppression of urine. He also mentioned two fatal cases caused by the application of cantharidal blisters, and what he said in denunciation of this form of counter-irritation was supported by two other

practitioners who were attending the meeting at which Huchard made his report.

On the other hand Dr. Ferrand, a practitioner who also joined in the debate, pointed out what Saundby and others know full well, namely, that blisters were useful and not dangerous, *unless they were left on too long*. It seems to us that the physician who desires to employ a cantharidal blister should remember two facts, namely, that blisters of large size are contraindicated in the presence of renal irritation or inflammation, and that in any event they should not be allowed to remain in contact with the skin longer than is necessary to produce the vesication. If these facts are borne in mind the evil effects which are feared by Huchard will not be met with, and patients will not be deprived of a useful though painful therapeutic measure owing to the fear of the physician that an accident may occur.

Convinced though we are that vesication is of value in the condition which we have named, we do not believe that it is to be employed recklessly or when milder counter-irritants such as the ordinary rubefacients would do as well. In Huchard's case the cantharides were applied to relieve gastralgia. Again, we think that the profession is gradually coming to the view that the application of cantharidal blisters to the walls of the thorax in the treatment of pneumonia and pleurisy, except in the very earliest stages, are of little real therapeutic value and frequently cause the patient a great amount of pain and annoyance. In children who are suffering from thoracic inflammations blisters certainly ought not to be employed, first, because of the pain; second, because of the nervous irritation which they produce; third, because if the child is ill for a considerable period of time difficulty may be met with in healing of the sore; and lastly, because renal irritation and irritative fever are apt to be caused by the external use of this drug in this class of patients.

CARBOLIC ACID AS A DISINFECTANT.

Nearly twelve years ago the Committee on Disinfectants of the American Public Health Association, composed of eminent bacteriologists and those interested in public health, made a report which while it received widespread notice did not receive the attention that its importance demanded. In this Report they included the results of a long and careful series of experiments designed to determine the disinfectant or germicidal value of nearly all of the substances which are commonly used for the purpose of destroying germs, and it will be remembered that as a result of their labors we were confirmed in our earlier belief that bichloride of mercury, in proper solution and in proper surroundings, formed at once the most useful and powerful of all disinfectants. Also that for the disinfection of large masses of material and for cheapness and efficiency chlorinated lime when freshly prepared and containing due proportions of chlorine formed the next best disinfectant, and in many respects was superior to corrosive sublimate itself.

These same studies, moreover, proved beyond doubt, as have many subsequent ones made in other countries, that carbolic acid has a reputation as a germicide far above that which it deserves; that the ordinary solutions of carbolic acid are almost useless as germicides, though they were active as antiseptics; and that it requires very many hours exposure to very strong solutions of carbolic acid to kill pathogenic germs. Notwithstanding these studies, however, and notwithstanding the fact that surgeons have for a number of years ceased to employ carbolic acid for surgical purposes, to the extent that they did previously, the laity and some members of the profession seem to regard carbolic acid as the ideal disinfectant and scatter it about premises and rooms in a manner which, while it assails the nostrils of the individual, does little towards protecting him from infection. Further than this, carbolic acid can be obtained at any drug store in any quantity upon the request even of a child, and is generally sold without a question being asked as to the purpose for which it is intended. In other words, the laws regarding the sale of poisons do not include carbolic acid in the list of those which shall not be sold without a physician's order. Further, very few of the laity, and some of the profession, seem to be ignorant of the fact that carbolic acid while it is a poor disinfectant is on the other hand one of the most rapidly acting and lethal poisons known, capable of destroying life within a very few minutes after its ingestion, or of causing death later on by reason of the primary and secondary changes which it produces in the body. In 1892 we called attention to this fact in a leading article in the THERAPEUTIC GAZETTE, our attention being once more called to the matter at that time by the report of four cases of carbolic

acid poisoning in *The Chemist and Druggist* for that year.

Our attention has again been called to this matter by an interesting paper by Dr. J. Dixon Mann, Professor of Forensic Medicine in Owens College, Manchester, upon "Some Statistics of Carbolic Acid Poisoning," which is published in *The Medical Chronicle* for December, 1896. After mentioning a number of facts which we have already spoken of and pointing out how frequently carbolic acid is handled carelessly and placed in the way of children and ignorant members of the laity, Dr. Mann publishes a table in which he shows that from 1885 to 1895 the total number of deaths from this poison in Great Britain amongst males was 176 and amongst females 109; 52 of the males were in children under five years of age, and 26 of the females were under five years of age. He then goes on to point out that carbolic acid stands fourth among the poisons by which death was accidentally or negligently caused during the ten years ending 1894, and if chloroform and lead, the first of which has produced accidental death in a large number of cases and the second of which produces poisoning in the arts, are excluded carbolic acid takes the second place among the poisons which have caused accidental death from personal carelessness or ignorance.

Again, Dr. Mann points out that in the ten years which we have mentioned one-fourth of the women who committed suicide by poison did so with carbolic acid, and it ranks second as a suicidal poison for males; while if the two sexes are taken together carbolic acid stands first of all poisons used for the purpose of committing suicide. It is also interesting to note that the number of people who commit suicide by means of carbolic acid has rapidly progressed each year: thus in 1891 there were 63; in 1892, 73; in 1893, 117; and in 1894, 167. He also mentions two cases in which carbolic acid was used for the purpose of committing murder, the victims being children; and two cases of manslaughter also occurred.

Finally, he sums up the facts that during the ten years we have named 917 deaths were due to carbolic acid, an average of nearly 100 deaths; and that in 1894 the number of deaths from this cause reached the appalling total of 202.

Dr. Mann urges, therefore, what we have previously urged, that a restriction should be put upon the sale of this violent poison; and we doubt not that an examination of statistics in this country would give conclusions nearly identical with those obtained by Dr. Mann from a study of the statistics in the United Kingdom of Great Britain.

THE USE OF THYROID EXTRACT AND ITS SUBSTITUTES.

The thyroid gland having become a recognized and valuable therapeutic agent in the treatment of several grave, although comparatively rare, affections, there have naturally been many studies made with the object of decreasing the bulk of the ordinary dose and of preparing the gland or its extract so that its administration would be as unobjectionable as possible. With this in view there have been prepared capsules containing concentrated extract of thyroid and tablets containing desiccated thyroid gland of such small bulk that one tablet containing two grains is equivalent to five grains of the fresh gland; and these tablets and capsules, or the desiccated gland itself, have been used for many months with the greatest possible satisfaction in the treatment of myxedema, cretinism, and obesity of certain types.

Not satisfied, however, with the use of the gland in this form certain German investigators have endeavored to isolate from it its so-called active principles and to market these derivative substances in small bulk, accompanied by the statement that they in every way represent the activity of the gland itself.

Clinical results, however, do not indicate that their theoretical views concerning the activity of these derivatives are correct, and not only is this true, but careful physiological study indicates positively that their influence upon general bodily metabolism is quite different from that exercised by the complete gland. It seems evident, therefore, that the entirely unobjectionable whole gland prepared in desiccated powder or capsule or in compressed tablet is the only means by which we ought to attempt to treat myxedema and similar conditions in which this animal substance has been found useful.

THE SURGICAL TREATMENT OF PERFORATING TYPHOID ULCER.

Two noteworthy contributions have appeared upon this topic, one—the most important and thorough—by Finney of Baltimore (*Annals of Surgery*, March, 1897), the other by Monod and Van Verts (*Revue de*

Chirurgie, March 10, 1897). Finney states that Richter in 1762 first suggested the advisability of opening and draining the peritoneal cavity in cases of general suppurative peritonitis. The first operation undertaken in a known case of typhoid fever was performed, he states, by Leücke of Strasburg. A wedge-shaped piece of the intestine was excised and the bowel sutured. The patient survived but a few hours. Finney has since collected forty-six cases reported in the literature upon this subject, and adds to this number six hitherto unpublished cases, including three of his own —in all fifty-two cases. From a study of statistics he finds that perforation of the intestine occurs in from one to two per cent. of all typhoid-fever cases, and as a cause of death in fatal cases it is found in between six and seven per cent. It occurs in the ileum, usually in the last two feet, in over eighty per cent. of all cases; in the large intestine in more than twelve per cent.; in the vermiform appendix in about five per cent. of all cases. It is usually single, but may be multiple. There seems to be no definite relation between perforation and the severity of the attack. It takes place in the mild as well as in the severe cases; the symptoms marking its onset may be sudden and severe or very mild, and are at times even wanting. It is more frequent in men than in women in about the ratio of three to one, and is rare in children. It commonly occurs between the ages of twenty and thirty and in the third week of the disease. The duration of life following this accident is short. Over eighty-three per cent. of all cases die during the first week.

Peritonitis resulting from perforation, if local, may result in spontaneous cure. It is possible for peritonitis to develop from causes other than perforation. Thus it may be due to ruptured mesenteric glands, abscess of the liver, perforating ulcers of the gall-bladder, softened infarcts of the spleen, etc. It is therefore evident that an estimation of the percentage of recovery is impossible.

Including all the cases that have been reported as operations for perforating typhoid ulcer, together with the six cases which he has collected himself, Finney states that the percentage of recovery is 32.68; excluding however all doubtful cases 45 are left, of which 11 recovered, a percentage of 26.22.

Finney believes that his investigation does not throw much light upon the still mooted question of the respective merits of irrigating or wiping the peritoneal cavity. He holds that the irrigating fluid should be normal salt solution, and that excision of the edges of the ulcer, or resection of a portion of the bowel containing the ulcer, is uncalled for. Should the intestinal wall be in such bad condition as to render suture of the perforation unsafe or impossible, the involved loop should be pulled out of the abdomen and left there for subsequent resection and anastomosis after the patient has recovered from his fever. He prefers the mattress suture of Halsted and advocates the invariable employment of drainage. It is best accomplished by means of wicks of iodoform gauze carried into different parts of the abdominal cavity if there is a general septic peritonitis, with the ends brought out through the abdominal wound. Drainage should be practised in the most dependent portion.

In over fifteen per cent. of the cases diagnosis was incorrect, but in all cases there was found an intraperitoneal condition absolutely requiring operation. The signs upon which Finney places most dependence are sudden acute pain in the abdomen with symptoms of collapse, accompanied by an abrupt fall in the temperature; vomiting is often present. Other symptoms, such as obliteration of liver dulness, gurgling sound on respiration, hiccough, etc., are useful when present. There is as yet no sign pathognomonic of perforation. The examination of the blood, however, promises to be of distinct diagnostic aid in this record. During the course of typhoid fever the number of white corpuscles gradually sinks, reaching its lowest point at about the end of the febrile period; with the development of the inflammatory complication there is a marked increase in the number of leucocytes, and one which takes place under no other known conditions.

Finney states that in the treatment of a case of perforating typhoid ulcer there are three things to be done: (1) Finding and closing perforation; (2) emptying and cleansing the peritoneal cavity; (3) the establishment and maintenance of effective drainage.

The method employed in his three cases seemed to him most satisfactory. The steps of the operation are as follows:

An oblique incision in the right iliac region, as if for appendicitis, long enough to give ample room through which to work, say six inches in length. Find the cæcum, which is always to be recognized by the longitudinal bands. This is the guide to the ileum (or appendix). Then with this as a starting point systematically draw out the coils of

ileum through the abdominal wound. Let an assistant wipe the intestine as it is withdrawn with a gauze sponge wrung out of hot salt solution, and another assistant keep it covered with warm salt sponges or towels. All the infected intestine should be drawn out of the peritoneal cavity, ileum, jejunum, duodenum—if necessary the whole of the small intestine. Then with large gauze abdominal pads and sponges wrung out of hot salt solution, carefully and systematically wipe out the peritoneal cavity until macroscopically clean, paying special attention to the pelvic portion. It is not usually necessary to irrigate with salt solution to do this. Next uncover the intestines and irrigate them throughly while outside the abdomen with hot salt solution; then begin to replace them in the inverse order from that in which they were withdrawn, being careful to wipe them dry, and free them thoroughly from flakes of lymph, fecal matter, etc. The worst coil should be the last replaced, and the sutured portion next the abdominal wound; this should be packed about with strips of bismuth gauze, and a strip introduced into the pelvis, if necessary. By packing about the worst or sutured coil of intestine and leaving it superficially placed, you insure good drainage and provide for the escape of extravasated fecal matter, if any such extravasation should take place. Then close the abdominal wound tightly, except a small opening for the gauze drain to come through. If there is much distention the bowels should be moved early and thoroughly by calomel in broken doses, followed by salts, and if necessary a high turpentine and soap-suds enema.

If stimulation is necessary, more reliance is to be placed on hypodermics of strychnine, enemata of several ounces of hot black coffee, and the transfusion into the cellular tissues under the breast of a quart or more of the normal salt solution, than on any other remedies.

Finally, (1) of all the so-called diagnostic signs of perforating typhoid ulcer, most reliance is to be placed upon the development of an attack of severe continued abdominal pain, coupled with nausea and vomiting, and at the same time a marked increase in the number of white blood-corpuscles; (2) the surgical is the only rational treatment of perforating typhoid ulcer; (3) there is no contraindication to the operation, surgically speaking, save a moribund condition of the patient.

The statements of Monod and Van Verts correspond closely to those of Finney as far as the historical part of the subject is concerned. In their statistical study, however, they reject a number of cases as not being certainly typhoid. They carefully consider the objections to intervention, finding none of them sufficient to contraindicate operation, not even diagnostic difficulties to which they accord a proper importance. They tabulate twenty-seven cases in which they consider the diagnosis absolutely certain. Of these five recovered, a total mortality of 81.5 per cent. The mortality of expectant treatment from perforation according to Richardson is ninety per cent., of general perforation following typhoid ulcer ninety-five per cent.

The prognosis is, of course, better when perforation comes late in the disease and occurs in the milder forms of the fever, and when the operation is performed promptly. Barring shock, the usual cause of death is peritonitis. In no case did autopsy show a giving way of the bowel at the seat of suture.

As to operative technique, these authors prefer median celiotomy, unless the peritonitis is circumscribed and can be localized by palpation. The extremity of the small intestine is first explored, beginning at the ileocæcal valve, continuing upward for about two feet. The ulcer having been found is sutured with catgut without previous freshening; the Lembert stitch is employed. Multiple perforations of a small section of the bowel would indicate section of this loop of intestine, bringing the divided ends into the abdominal incision. If the general peritonitis is present, the abdominal cavity should be washed out with a mild antiseptic fluid. Drainage is accomplished by means of gauze wicks.

The after-treatment is a stimulant one. The patient may be given iron and alcohol, injections of ether and caffeine, and especially subcutaneous or intravenous injections of serum in large doses.

The authors conclude with the statement that the results of surgical intervention in generalized peritonitis consecutive upon intestinal perforation are not encouraging, but are better than the results of more conservative treatment by a small percentage. Thus in the presence of distinct indications of perforation it is the duty of the surgeon to operate promptly, unless the patient is evidently in such a collapsed condition that any intervention will necessarily be immediately fatal.

Reports on Therapeutic Progress

EUCAINE AS A LOCAL ANESTHETIC IN THE SURGERY OF THE THROAT, NOSE, AND EAR.

HORNE and YEARSLEY, in the *British Medical Journal* of January 16, 1897, give the details of an interesting investigation of this new drug. The solutions used were in three strengths—two, five, and eight per cent. Of these, they found that the two-per-cent. is quite sufficient for anesthetizing the uvula, etc., for laryngoscopy or posterior rhinoscopy, and for aural examinations. In one case seven drops of a warm two-per-cent. solution dropped into the left ear and retained (with the head inclined to the right) for five minutes caused complete anesthesia of the membrana tympani lasting nearly twenty minutes. Another man, who was most intolerant of laryngoscopy, permitted a complete examination. In the latter case the eight-per-cent. solution was first used, but on the next occasion the two-per-cent. was found sufficient, as also for two other cases of posterior rhinoscopy. The five- or eight-per-cent. solutions have been used for operative procedures on nose, throat, and ear; and although in one case an aural furuncle was incised without pain under the five-per-cent., and in four other cases the same solution sufficiently anesthetized the membrana tympani to permit of myringotomy, it was generally found that for all operative measures on throat, nose or ear the eight-per-cent. solution was the more reliable. Furthermore, eucaine being in their experience (so far) devoid of unpleasant after-effects, it is of advantage to use the stronger solution. In the first case an attempt was made to cauterize an inferior turbinate body under a two-per-cent. solution, thus obtaining their only unsatisfactory result, the case requiring the five-per-cent. before proceeding. They recommend for the ear, warm instillation retained from five to eight minutes by inclining the head to the opposite side; for the nose, either simple swabbing, or the insertion of a pledget of cotton-wool soaked in eucaine for five to ten minutes; for the throat, simple swabbing with a pledget of cotton-wool. On no occasion was eucaine applied by means of a spray.

The authors have found that the anesthesia is slightly slower in onset than that of cocaine, and that five to ten minutes must elapse before the cases were ready for operation. When established the anesthesia is fully equal to that of cocaine, and in this the writers' opinion is endorsed by the patients who had previously experienced the latter. The duration of the anesthesia is from ten to twenty minutes, fifteen minutes being the most usual time. In the extent of the anesthesia they have had no reason for dissatisfaction. They found that when the membrana tympani was anesthetic, the tympanum and ossicular chain were equally so. A pledget of wool passed into the anterior half of the nares rendered the inferior turbinate body anesthetic in its whole extent. Similarly, simple swabbing of the tonsils rendered them anesthetic throughout.

So far their investigations as to the effect of eucaine on the pulse are inconclusive. In many instances the observations must be excluded as unreliable, on account of the mental influences in the patient due to operation. In the few instances, however, in which the observations may be considered reliable, the pulse has remained the same in rate and character throughout. In no instance have they noted any slowing of the pulse. In only three cases have they seen any unpleasant effects upon the circulation following an operation or examination under eucaine, and in each of these there was sufficient reason to otherwise account for the trouble without attributing it to the drug.

Their observations upon the local effects of eucaine on the circulation are at present incomplete, several points having arisen requiring further consideration. They have not, however, found it to cause hyperemia of the turbinate bodies—in fact in several cases it has induced slight ischemia. In two cases it has been noted that a turbinate body which before the application was in contact with the septum was not touching it in any part when anesthesia was established. Of course, any ischemia observed was not to be compared to that caused by cocaine. This is a point upon which they hope to make further observations in the future. In no case has there been the hemorrhage after an operation which so often forms an unpleasant feature of cocaine anesthesia.

They desire to mention an apparent effect upon the salivary secretion. In the first case in which an eight-per-cent. solution was used to anesthetize the uvula for laryngoscopy, a considerable increase of saliva was noted. On another occasion, when a two-per-cent. solution was used, this feature was absent. A similar increased salivation was noted in another case under the two-per-cent. solution.

In another case of posterior rhinoscopy the saliva was not increased. Out of four tonsillotomies, in only one was increased salivation noted. This is an important point for decision by future observation, as its upholding will establish another point of difference from cocaine (which decreases the salivary secretion), and may detract from the usefulness of eucaine in operations upon the oral cavity.

With the exception of three cases the authors have not noted a single instance of what might be construed as an unpleasant after-effect; the three exceptions have already been alluded to and explained. They allude to six cases as having experienced the effects of the use of cocaine. In the first of these, a female aged fifty-five, the use of cocaine for the removal of a nasal spur had caused such alarming syncope as to necessitate the employment of ether and amyl nitrite. This case has since been three times under eucaine without the least discomfort. The five remaining cases all declared that, whilst cocaine had caused unpleasant sensations in the mouth and throat (variously described as "contracting," "freezing," and "numbing"), lasting for some hours, eucaine on the contrary rendered them anesthetic to the operation without causing any after-effect greater than (in one case) an unpleasant taste lasting half an hour.

Several points remain for further experience to decide, but they consider that their results so far justify them in continuing the investigation. Eucaine cannot, however, wholly replace cocaine, since the effect of the latter in reducing the size of the turbinate bodies gives it a value as an aid to diagnosis which eucaine does not appear to possess.

THE TREATMENT OF PHTHISIS BY GUAIACOLATE OF PIPERIDINE.

Another treatment for pulmonary tuberculosis has been devised by CHAPLIN and TUNNICLIFFE and reported in the *British Medical Journal* of January 16, 1897. They begin by saying that the success which has attended the treatment of phthisis by creosote and its derivatives, especially in the earlier stages, has led the authors to try a newly synthesized body, piperidine guaiacolate, which not only contains an antiseptic moiety, but also a constituent which possesses a nervine and vascular tonic action. In order to put their results with this substance as succinctly as possible, they divide their paper into three parts—(1) Chemistry, (2) Pharmacology, (3) Therapeutics.

Piperidine guaiacolate has been prepared by Dr. Schidrowitz, and for its chemistry we are indebted to him. It is a compound formed by the action of piperidine on guaiacol in a suitable solvent, such as benzol or petrolic ether, and it must be regarded as a guaiacolate of piperidine, having the formula $C_5H_{11}NC_7H_8O_2$. Its exact chemical composition is still under investigation; it crystallizes in prismatic needles or plates; it is soluble to the extent of 3.5 per cent. in water, and is also easily soluble in most organic solvents; it melts at 79.81° C.; it is decomposed into its constituents by mineral acids and alkalies. The chemical property which from a pharmaceutical standpoint is most worthy of note is the relative solubility of this salt. This becomes emphasized when the insolubility of the carbonate of guaiacol is borne in mind. The solubility is such that ten grains can be administered in an ounce draught of simple water, or if the specific gravity of the medium be raised by the addition of a little glycerin or mucilage a dose of from twenty to thirty grains can be given.

The pharmacology of the guaiacolate of piperidine resolves itself into the pharmacology of guaiacol and piperidine, for it is into these substances that the salt is decomposed, probably not in the acid medium of the stomach, but in the alkaline one of the duodenum. The reason for this assumption is that large doses (one drachm) can be given without the slightest eructation of guaiacol. The action of guaiacol is too well known to be discussed here; it acts in the intestine as an antiseptic; in the structures through which it is excreted—for example, the respiratory mucous membrane—it acts also as an antiseptic. When hydrochlorate of piperidine, suitably diluted, is injected into the circulation in doses of 0.05 gramme to the kilo of body weight the heart is slowed and the vessels contracted, a considerable rise of blood-pressure taking place. When injected under the skin in doses of from one to two centigrammes to the kilo, an increase in reflex excitability occurs, so that if the drug is pushed convulsions may develop. Thus in suitable doses piperidine must be regarded as a cardio-vascular tonic and spinal stimulant.

During the last three months an inquiry as to the value of piperdine guaiacolate in the treatment of pulmonary tuberculosis has been carried out at the City of London Hospital for

Diseases of the Chest. The patients to whom the drug was given were subjected to close observation, and the effects of the medicine were noted from time to time. In all, fourteen cases were placed under observation, of which eight were out-patients and six in-patients. The duration of the observations varied, but as a general statement it may be said that six weeks was the average. In order to efficiently test the value of the drug cases were chosen more or less haphazard, some being early cases in which improvement might be expected under appropriate treatment, others being more advanced, while yet others were in such a stage as to make it improbable that much good from any form of treatment would accrue. In all cases the dose to begin with was fixed at five grains three times a day, and this was gradually increased until twenty, and in one case twenty-five, grains were given for a dose. So far as could be gathered from questioning patients and personal observation, no unpleasant effects were noticed. All of them stated that the medicine had agreed with them. Pains were taken to ascertain if the drugs produced any gastric or intestinal irritation, but in no case could it be determined that the processes of digestion were in any way interfered with by the medicine. The authors think this worthy of special stress, because experience has so often taught them that when other derivatives of creosote, such as crude guaiacol, are given over a lengthened period, their use has to be discontinued from time to time, owing to the gastric and intestinal disturbances caused by them. But in these cases no such untoward effect appeared.

With regard to the varied symptoms of phthisis it is difficult to say with certainty that the guaiacolate of piperidine had any distinct effect upon them, for in all cases of phthisis it is so frequently found that improved hygienic conditions (good food, rest, and attention), such as residence in a hospital affords, play a large part in the restoration of the patient's health. This much may, however, be said, that in many instances the cough appreciably improved while the treatment was in progress. The temperature was in no case affected adversely by the drug; in most cases it receded to normal. The appetite for the most part was maintained, and very often patients expressed the belief that the medicine improved it; indeed, in some cases it seemed that it had a markedly good effect upon the appetite. Some patients gained in weight while the treatment was going on, and in two instances it was thought that more flesh was put on than would have been the case had ordinary remedies been tried. The expectoration in most cases decreased while the drug was being taken. Among the out-patients especially there was a general improvement in strength and vitality. In the case of out-patients it must be remembered that improved hygienic conditions do not come into operation to the advantage of the patient as they do in in-patient practice.

Coming now to speak of the changes noted in the physical signs, it must be admitted that discussion of this subject is full of difficulty, for it so often happens that, although considerable improvement takes place in the general condition of the patient, yet no marked change occurs in the physical signs. Some of the cases (out-patients) whose condition was found to be improving were examined week by week to see if any change could be found in the physical signs. Consolidation and excavation were of course unaffected, but in not a few instances the lungs were noticed to become drier with less moist crepitant râles. This change was attributed to the fact that the area of simple inflammation around the tuberculous infiltration itself had passed from an active to a more quiescent condition. It must be admitted, however, that the same improvement in physical signs could not be seen in most of the cases under treatment as in-patients. Two out-patients considered that the medicine relieved their dyspnea, and to judge from the lung signs, which were improving rapidly under the treatment, it might very well be the case.

In stating the effects of any new drug upon a given disease the physician must always guard himself against "overenthusiasm;" so often it happens that a new medicine has been reputed to be successful in some affection, and upon fuller trial its effects are found to be trifling, or even *nil*. Of piperidine guaiacolate it may be generally stated:

1. That experience has shown that it is a perfectly safe drug in doses from five to thirty grains three times a day.

2. That it causes no unpleasant effects.

3. That it is exceedingly well borne by the stomach, and in this respect it is equal to any other derivative of creosote.

4. That patients while under its influence improved in appetite and general strength.

A PRESCRIPTION FOR BLEPHARITIS.

The *Revue de Thérapeutique Médico-Chirurgicale* of January 15, 1897, states that LANDOLDT employs the following ointment:

℞ Neutral acetate of lead, 2 grains;
Hydrochlorate of cocaine, 3 grains;
White vaselin, 45 grains.

This ointment is to be applied to the edges of the inflamed lid.

A PRESCRIPTION FOR HOARSENESS OF THE VOICE.

℞ Hydrochlorate of morphine,
Hydrochlorate of cocaine, of each 1-12 grain;
Tincture of aconite, 2 drops;
Powdered marshmallow, 3 grains;
Sugar, a sufficient quantity.

Make into one pastille and take eight or ten such a day.

—*Revue Thérapeutique Médico-Chirurgicale*, Jan. 15, 1897.

CREOSOTE IN THE TREATMENT OF PLEURO-PERITONEAL TUBERCULOSIS IN CHILDREN.

In the London *Lancet* of January 16, 1897, Professor THOMA writes an interesting article on this important subject. He first emphasizes the fact that peritoneal tuberculosis in children has for several years been treated by laparotomy, and the results are often very good. We have learned also to distinguish the different forms of this disease, so that its diagnosis and treatment are easier than formerly. Laparotomy is no doubt the best and quickest of all methods for dealing with those cases in which the peritoneum is covered with miliary tubercles; but it is always a serious operation and one also which not every medical practitioner is competent to perform. Moreover, the parents of the little patients are usually averse to surgical interference and anxious for the employment of some other means, so that it is not surprising that physicians should welcome a non-surgical treatment of this dangerous illness. In former years general tonics, painting with collodion, and the local application of iodines were principally relied on; but the results were often bad. Ichthyol has been employed of late years; it is certainly a good remedy, and in spite of its disagreeable smell the author has many times used it with satisfactory results in acute inflammations of the peritoneum. It has frequently happened, however, that these various methods were either ineffectual or else so tedious that children were obliged to stay too long in the hospitals.

Not long ago the idea occurred to the writer that in these cases creosote might be advantageously administered in enemata. The first writer who recommended this treatment was Dr. Revillet of Cannes, but he employed it only for the treatment of phthisis; and after him many physicians have had favorable results. Sometimes this substance disagrees with the patients, causing diarrhea and pains in the abdomen, so that it has either to be discontinued or combined with acetum opii ("black drop"), but this adjunct does not always succeed, and is often contraindicated. Another difficulty is the necessity for the patient's retaining the enemata as long as possible, in order that the creosote may be completely absorbed. With very young children this is hardly possible, but with his two little patients it was very easy. The enema was given each evening when the child was quiet and before it was put to bed. At first the child could not retain the enema more than three or four hours, but after some days it slept well, and on many occasions only a little oil was found in the morning along with the first motion of the bowels. Dr. Revillet directed the enemata to be prepared with water, a small quantity of almond oil, and the yolk of one egg. Recently, however, it has been proposed by a chemist of Grenoble to administer creosote in milk; forty-three drops of creosote are mixed with a quarter of a glass of milk, and water is afterwards added. This method is evidently more simple and has the advantage that the milk is taken by the mouth, for everybody knows the difficulty of feeding an unwilling child. Nevertheless the writer prefers the association of cod-liver oil with creosote. In an interesting memoir presented to the Faculty of Medicine in Geneva, Dr. Loppino, confirming the experimental researches of Professor Schiff, has proved that fat is very well absorbed by the rectum, and that oleaginous injections are highly important agents in combating emaciation and cachectic states. Dr. Loppino has never seen any bad effects resulting from the practice; the best results were obtained in the case of neurasthenic and tuberculous patients, and it is a useful mode of carrying out the treatment by overfeeding introduced by Dr. Weir Mitchell. This circumstance induced the author to try enemata composed of a mixture of cod-liver oil with creosote. At the outset each enema contained 150 grammes (about four ounces) of emulsified oil and 0.5 gramme (eight grains) of creosote, but after from eight to

ten days he gave one gramme of creosote. In the first case the child took in the course of some days 1.5 grammes of creosote; diarrhea ensued, and the enemata had to be discontinued. After the treatment has been continued for some weeks it is a good plan to suspend it for five or six days and begin again. The author has not noticed that the taste of creosote was perceived by the children; their appetite was somewhat impaired at first, but was not lost, and subsequently improved. By this method it is possible to relieve the disorders of the bowels so frequent in this illness. He thinks that the antiseptic action of creosote is valuable against intestinal fermentations; it is not unusual to find constipation alternate with diarrhea in the first stage of tuberculous peritonitis, an important cause of that condition being weak digestion and the slowness or rapidity of the movements of the intestines. The antiseptic action of the mixture of cod-liver oil and creosote is very efficacious against these troubles, and after some days an improvement will be seen. The absorption of the creosote was unquestionable, for on many occasions the urine was dark-colored. It is possible that creosote may have a curative effect on tuberculous deposits.

The first of the author's cases was a boy, eleven years of age, whose father and mother were alive and in good health. One sister of the mother died from tuberculosis some years previously; the child had often been to see her and was kissed by her. In August, 1894, he fell ill with pleurisy on the right side; the attack lasted fifteen days, but he seemed to recover perfectly. In November he suffered from cough; in February, 1895, he lost his appetite, became very weak, suffered from abdominal pains, and went into the hospital on March 1. On admission he was thin and feverish, his evening temperature being 38.5° C. His tongue was thickly coated and he had no appetite, but there was no vomiting. The abdomen was distended, but not very painful; there was retraction of the hypogastrium, but no indication of ascites. Some obstruction was felt on deep palpation, and there was diarrhea. The urine was normal. The patient had a little cough, and on the left side there was rough respiration with egophony; the breath sound was rough and the expiration prolonged at both apices. Milk diet was given, a blister was applied over the left lung, and ichthyol on the abdomen. On March 7 the signs of pleurisy were increased. An enema containing nine grains of creosote was administered. On the 14th the enema was retained for eight hours and caused no pain. On the 16th an enema containing fifteen grains of creosote was given. The diarrhea had now ceased, and the condition of the left lung was also better. On April 10 slight ascites was recognized, but the abdomen was less distended and more yielding. On the 20th the amount of creosote was raised to eighteen grains, and the patient's state, both general and local, improved. On the 27th slight diarrhea necessitated the temporary discontinuance of the creosote, as the last dose had been too large; but after a few days the treatment was resumed, and on June 25 the patient's general state was very good, the lungs and abdomen being normal. He then went into the country. The author saw him on August 17, and found that the improvement was fully maintained. On October 5 he set out for Cannes in perfectly good health.

The writer's second case was that of a girl, seven years of age, whose father and mother were in good health. In 1890 she suffered from influenza and bronchitis, and frequently from cough since that date. In March, 1895, her strength and appetite failed. On March 26 fever and cough set in, and on the 29th she was admitted into the hospital. She was at that time anemic and thin, and had symptoms of general bronchitis; on the right side there was a harsh breath sound, with bronchophony and signs of slight, dry pleurisy. There were also diarrhea and loss of appetite, but there was no vomiting. The abdomen was distended, with some retraction in the lower part; there were no ascites; the intestines seemed to be matted together. The treatment consisted in the application of ichthyol to the abdomen and the administering of an enema with nine grains of creosote, but after some days the dose was raised to fifteen grains. The symptoms of bronchitis gradually subsided, and on May 30 the abdomen was less distended, but it was necessary to make an application of collodion to it. On July 1 the abdomen was yielding and free from pain, the diarrhea had ceased, the appetite was good, and the general health was excellent. The child weighed twenty kilogrammes (44 pounds), being a gain of three kilogrammes (6½ pounds). She then went home, but returned to the hospital in the month of August, having partaken too freely of fruit, which had caused diarrhea. After some days of ordinary treatment the diar-

rhea ceased, and at the end of September the patient's health was very good.

Of course it is inexpedient to generalize from two cases, especially as these children were not very ill and were treated promptly; but, keeping in mind the comparatively short duration of the treatment and the necessity for preserving the appetite and the digestive functions as unimpaired as possible, it seems that enemata of cod-liver oil and creosote are well tolerated and give good results.

FORMALDEHYDE.

In the *Medical Chronicle* for December, 1896, LEECH gives an interesting summary of the therapeutic possibilities of formaldehyde. Formic aldehyde (CH_2O) is produced when by means of a specially constructed lamp the vapor of methyl alcohol (CH_3OH) is passed over an incandescent platinum hood or mantle. The following formula represents the reaction: $CH_4O+O=CH_2O+H_2O$. For some time past a solution of formaldehyde in water of a strength of forty per cent. has been on the market under the name of formol or formaline.

Mosso and Paoletti find that formaline has a bacterial action almost equal to that of corrosive sublimate, while it is much less toxic. One part in 20,000 is sufficient to slow the ammoniacal fermentation of urine, and 1 in 4000 inhibits it altogether. Formaline hinders the coagulation of albumen by heat, but hastens the clotting of blood. It has little influence on the frog's heart, unless in solutions over one per cent. in strength. Very small doses, however, are sufficient to raise the blood-pressure and markedly affect respiration. Doses exceeding one cubic centimeter per kilo of body weight quickly cause death; doses of 0.1 cubic centimeter are poisonous if introduced into the circulation; and even smaller doses produce marked symptoms of irritation. A powerful action on the nervous system is shown, resulting in convulsions, analgesia, and lowering of temperature.

Formaldehyde has been found very useful in pathological work for hardening microscopic preparations and museum specimens. Orth has recently pointed out the value of formaline in this connection.

Several observers have experimented with formaldehyde in the disinfection of rooms. Some of the more recent papers are those of Roux, Trillat, Pfuhl, and Hebert. Opinion is divided as to the practical value of formaldehyde for this purpose.

Horton considers formaline particularly suitable for the disinfection of books, as the vapor is not detrimental in any way to them, while it is very rapid in its disinfectant action. The effect produced during the first fifteen minutes is practically as great as that after twenty-four hours' exposure. He found that in a closed space books can be thoroughly disinfected by using one cubic centimeter of commercial formaline to 300 cubic centimeters of air.

Turning to the therapeutic uses of the drug, Schleich found that when a watery solution of gelatin is allowed to dry in formaline vapor the chemical characteristics of the gelatin are altered. It is no longer affected by hot or cold water, nor by acids or alkalies. Animal tissues, however, have the power of breaking up the combination and setting the formaline free. It was also found that when the formaline gelatin, ground to a fine powder and mixed with cultures of various forms of pathogenic bacteria, was introduced into animals the bacteria did not develop, and the wounds healed without trouble.

Schleich states that with this formaline gelatin powder every acute suppuration can be stopped in twenty-four hours, and wounds made to heal aseptically. He has used it in 120 cases of acute suppurative processes, in ninety-three aseptic wounds, four compound fractures, and two deep scalp wounds. The wounds were only cleansed mechanically, and then thoroughly rubbed with the powder. In fresh wounds the powder formed with the blood a quite dry and firm scab in a few hours.

In cases of necrotic masses, in old ulcers, etc., the powder had very little effect, but it was found that it could be digested with a pepsin hydrochloric acid solution (5 parts of pepsin and 0.3 of hydrochloric acid in 100 parts of water). The formaline gelatin powder is dusted on the wound, and then covered with a dressing wet with the pepsin solution, and the digestive process keeps up a continuous supply of formaldehyde vapor for the wound. The powder is made by drying 500 grammes of purified and dissolved gelatin in the vapor of twenty-five drops of formaline.

Foote has recently published a paper giving an account of forty-five cases of suppurative wounds in which he has used Schleich's formaline gelatin. He concludes that formaline has some antiseptic action, but not so great as to render a suppurating wound sterile. It seemed to control the infection for

two days, and if the character of the wound was such that this respite was enough to secure its closure, the result was perfect. If not, then whatever gain was made in the first two or three days was maintained, and the wound went on granulating from that point. This, however, is a distinct advance on the usual treatment. Another point in favor of the formaline gelatin is that it does away with the necessity of drainage. On the whole, Foote thinks the method marks a distinct advance in the treatment of suppuration, giving the most perfect results in those cases where the cellulitis is moderate and the pus abundant.

Alexander considers formaldehyde the "ideal germicide, deodorant, and antizymotic." He has used it in his practice for a year. He quotes De Buck and Vanderlinden as having used it successfully in one-half per cent. strength for washing hands and instruments, cleansing site of operation, and for rendering infected wounds, cavities and sinuses antiseptic. Formaline does not spoil the edge of the knives, apparently not attacking metal at all. Dr. Alexander uses the pure forty-per cent. formaline very successfully in chancroid and chancre, applying it locally, a single application being sufficient to cause the ulcer to heal rapidly. He found formaline solution a remedy for pruritus vulvæ when other drugs had failed. Four cases of diphtheria were treated with formaline and whiskey. The whiskey was given internally, and the atmosphere of the rooms impregnated with the vapor of formaline, direct application to the throat being also made with the formaline solution. He finds a spray of one-half per cent. valuable in hay fever, and a spray of one-per-cent. solution in whooping-cough. In ten cases of gonorrhea he used a one-half-per-cent. solution, injected three times a day, with satisfactory results; he found the treatment free from the pain or irritation usually caused by the use of sublimate and other solutions.

Howland has treated six cases of gonorrhea with formaline. In every case the gonococcus was found. He started with a five-per-cent. solution, but found this too strong. In the rest of the injections he used a one-half-per-cent. solution. For the first two or three days irrigations of one quart of hot formaline solution were given twice daily; afterwards once daily until the discharge ceased to contain the gonococci. No internal treatment was given except cathartic pills. All highly-seasoned food, alcohol, tea and coffee were prohibited. The patients were advised to drink two to four quarts of pure water in the twenty-four hours. Dr. Howland noticed peculiar action of the irrigating fluid on the gonococci. They "shriveled up" and lost their form.

De Smet claims good results from the use of formaldehyde in gonorrhea in women. Sixty cases, some very obstinate, were cured. The vulva was washed with a 1:1000 solution, and the vagina douched through a speculum with a strong solution, varying from 2:1000 to 5:1000. If the uterine cavity and cervical canal were involved, some of the same solution was injected. When there is laceration of the cervix, tampons soaked in 1:1000 solution of formaldehyde are left for two or three hours in the vagina. When fungous endometritis is present the curette must be applied first. The applications give rise to no pain, and may be used daily, or every second day.

Lamarque has used formol in one-per-cent. solution for washing out the bladder and urethra, and in five-per-cent. solution for instillation. In acute gonorrhea and in gonorrheal cystitis he has not had encouraging results. In chronic gonorrhea they have been better. He considers this treatment most successful in cases of tubercular cystitis. The only disadvantage is the pain caused by the drug, which, however, though intense, quickly ceases.

In ophthalmic practice formaldehyde has been used for some time. Valude, in May, 1893, made a communication on the subject to the Société Française d'Ophtalmologie.

Burnett has obtained excellent results in infecting ulcers of the cornea and in purulent conjunctivitis. Corneal ulcers may be touched with a solution of 1:200 or 1:500 every day. For general use as an antiseptic collyrium, a strength of 1:1000 or 1:2000 may be used, though the stronger of these sometimes causes a slight burning sensation.

Davidson finds one part of formaline in 2000 or 3000 of water the most serviceable strength of solution. When he tried it first in hypopyon ulcers, it was dropped into the affected eye three or four times daily, and it seemed of very little use, but on applying it freely every hour it acted very effectually. In abrasions of the cornea and in corneal ulcers, Dr. Davidson believes formaline will be of great value if applied freely and often.

Dr. Stephenson has found a solution of 1:2000 of service in muco-purulent and follicular inflammations of the conjunctiva, when applied thrice a day to the everted lids. In

trachoma it seems to have the power of reducing the amount of secretion.

Solis-Cohen has during the past year seen such good results in the treatment of tuberculosis of the larynx, alike in infiltrative, ulcerative, and vegetative cases, by means of formic aldehyde solutions that he is tempted to believe that in this agent we have a means of treatment superior to any other that he has ever used. He uses the commercial formaline, diluting it to the strength required, which ranges from one-half to four per cent. of formic aldehyde—that is, from one to ten per cent. of the commercial formaline, which contains 0.40 per cent. of formaldehyde. Before making the applications the parts should be thoroughly cocainized, otherwise the application to the mucous membranes causes an intense burning, stinging, and even strangling sensation.

The mode of application is similar to that employed with lactic acid. The parts are thoroughly rubbed with the formaldehyde solution after previous cleansing and cocainization. Beginning with the weakest solution, the strength is increased up to ten per cent. of the commercial formaline, which corresponds to four per cent. of pure formaldehyde. This is the strongest solution he has found it necessary to employ.

Pottevin has tried formic aldehyde for ringworm. The hair having been cut short, and the scalp cleansed, a compress of cotton-wool soaked in a two-per-cent. solution of formic aldehyde was applied to the affected parts, or, better still, to the whole scalp. The whole was then covered with an india-rubber cap, or piece of oiled silk, and left on for twenty-four hours, when a fresh application was made.

The results were not encouraging, as in most cases the remedy did not effect a cure. However, according to an abstract in the *Cincinnati Lancet-Clinic* of November 7, 1896, forty cases of ringworm of the scalp, in hospital out-patients, were treated by formaline applications. The preparation used was formaline in full forty-per-cent. strength, which was vigorously rubbed in with a brush or mop for ten minutes, the hair having been shaved round the patches. The application was repeated every other day on four occasions, and then entirely discontinued. Of the forty cases, only five required repainting from non-eradication of the disease. Microscopical examination was always made before commencing treatment, and the presence of the tricophyton verified.

IRITIS AND ITS TREATMENT.

In the *Medical News* of January 9, 1897, Dr. L. F. Love points out that the treatment of iritis has progressed but little since the early days of ophthalmology, and for the simple reason that if adopted early the old-fashioned treatment is eminently satisfactory. As in the days of our fathers, it consists essentially in the free exhibition of mercury, of local sedatives and derivatives, and in the free use of atropine. Mercury is best administered by inunction, the system thus rapidly coming under its influence. It should be remembered that the general condition of those attacked by iritis is usually poor, that not rarely the stomach is irritable, and the digestion impaired. Internal medication should therefore be avoided as much as possible, except so far as is useful to build up the system and correct disorders of digestion. The use of mercury should be pushed to the point of tolerance. "Gently touch the gums" is the good old rule, which is probably not very far wrong. Iodide of potassium is of little use in the earlier stages of the disease, but must be used after the inflammatory stages have passed, and when the mercury has been pushed almost to the point of salivation. If, unfortunately, your patient should object to inunctions, then some other form of mercury than the ointment must be used—the protiodide or bichloride internally, or better still the subconjunctival injections as used by Abadie.

Local treatment to reduce the inflammation is very efficacious. Love usually employs the Heurtelope or Swedish leech applied to the temples. Hot-water fomentations applied to the eyeball are useful in allaying pain, and possibly in lessening the congestion, and should be freely used at frequent intervals and as hot as can be borne. A boric acid solution should also be employed.

But the chief treatment is the use of atropine, which should be administered both early and late, and in sufficient strength to dilate the pupil thoroughly, and at such frequent intervals as to maintain the dilatation. In the early stages the use of a solution of four grains to the ounce of the sulphate of atropine applied every four hours, or even more frequently, is necessary to bring about this result. The writer has found good effects from combining cocaine with the atropine in the earlier stages; it lessens the pain and aids in the more rapid dilatation of the pupil. After full dilatation has been obtained the cocaine may be dropped, but the use of

atropine until all inflammation of the iris has disappeared is absolutely imperative. In uncomplicated cases which are seen at an early stage the progress is very favorable. With neglected cases complications are very liable to occur. The most simple is posterior synechia, which is altogether too frequently seen in eye-clinics, but it is unnecessary at this time to more than refer to the fact that most serious complications are more liable to follow neglect or maltreatment.

The writer has been greatly struck by the tolerance of mercury evident in many cases of iritis. He has seen numbers of cases which, as far as he could determine, were non-syphilitic, which bore readily the absorption of two to three drachms daily of mercurial ointment, for weeks and even months, with no symptoms of ptyalization; the mercury was continued until the eye whitened and the evidence of deep injection lessened. In these cases mercury acted as a powerful tonic, the general health improving even more rapidly when the inflammation subsided; and it is in these cases that the most successful results are seen. The author has already referred to the necessity of attending to the general health in many patients. As the majority of cases of iritis occur in patients whose systems have been run down by the presence of syphilitic or other poisons, the Turkish bath is especially useful, and tonic treatment should never be neglected.

In conclusion, he impresses upon the profession the facts that iritis is readily recognizable and is a most tractable disease if taken in time. The treatment is simple and effective, and there is no reason why nearly every case of iritis coming under competent care should not make a good recovery.

STENOCARDIA (ANGINA PECTORIS).

H. N. HEINEMAN of New York writes on this topic in the *Medical News* of January 9, 1897. After discussing the etiological and other factors in these cases he recalls the fact that a great many attacks are excited by the influence of cold. The avoidance of cold water, and even of tepid water, to any large surface of the body on account of the succeeding chill must be advised. Such patients must wash their bodies one part at a time, and have that part well dried and covered before proceeding to the next. Even the keeping of the hands well gloved, maintaining warm feet, protecting the mouth and nose from the sweeping cold wind or air, are precautions that will save the patient from many an attack. The regulation of the patient's life and habits come under this category. Avoidance of mental worry and emotion, of overexertion, and even needless exertion at times, is imperative. The patient must walk with deliberation, and the combination of walking and talking may be too great a strain for the heart until it is improved by general treatment. Tobacco should be absolutely interdicted, and all spirituous liquors as well. In persons who have always taken wine, a small quantity of a light Moselle or claret, preferably Moselle, may be taken diluted at dinner or, exceptionally, if the patient feels weak and in need of it. Overindulgence in food must be guarded against. If the patient has the prodromal symptoms of an attack, the seeking of shelter, of a warm room, of warmth to the surface, or resting lying down, may ward off an attack.

The general treatment must have two objects: first, the improvement of the heart and blood-vessels; and second, the relief of engorgement in the internal viscera and capillaries.

For the improvement of the heart and blood-vessels, the use of potassium or sodium iodide in from three- to five-grain doses kept up for months is an old remedial agent of a certain, though not always satisfactory, value. The treatment by saline baths and by the Schott method of exercises has a most potent effect in improving the condition of the cardiac muscle and vessels, and appears to have a direct effect in making the attacks less numerous and severe, and even in causing them to cease during a period of months or years.

The exercises with resistance, or Schott movements, should be carried out in the way indicated by the writer in a previous paper read before the general meeting of the New York Academy of Medicine. The movements are made in such a manner that the attendant can easily resist or hinder the movement, and the patient in seeking to complete the movement must overcome the resistance of the attendant. The movements must be made with especial care and caution in these cases, and the resistance at the outset must be at a minimum.

The artificial saline baths should contain from one to three per cent. of salt, and from one-fourth to one per cent. of chloride of calcium, and should gradually be strengthened by the addition of carbonic acid. By a

process now in the last stages of completion it will be possible to prepare the saline effervescent and saline effervescent flowing baths by means of a simple apparatus, so that the carbonic acid will be intimately mixed with the water.

For the relief of visceral and capillary engorgement we may resort to medicinal agents. Although the baths and exercises do this to a marked extent, the administration of a half-grain of calomel (well triturated) thrice weekly at bedtime, succeeded the next morning by a dose of Carlsbad sprudel salts, adds materially to the effect.

After the visceral engorgement has been much relieved, we can now use our nitrites, and in some cases nitroglycerin; for until visceral congestion is relieved it is only playing "hide-and-seek" to try to relieve the capillaries, which are immediately clogged again by the nearest congested viscus. Having accomplished this, we now find the cardiac tonics—sparteine, strophanthus, strychnine, valerian, and in suitable cases digitalis—of the greatest utility.

The general tendency to anemia and defective oxygenation must never be lost sight of, and general tonics, including the use of oxygen gas, as recommended by A. H. Smith, will be of excellent service.

The treatment of the attack includes the use of nitrite of amyl in from three- to five-drop doses poured upon a handkerchief, or taken from a glass pearl in similar manner and inhaled.

The use of nitroglycerin in $\frac{1}{100}$-grain doses is of less rapid efficacy. It may be repeated once in three or four hours, or even longer intervals In a severe attack it may be given at half-hour intervals, but should be given guardedly. In some patients the effect of nitroglycerin is immediate, in others very slow. Hypodermic injections of morphine, with or without atropine, is often of great service.

The use of ether or chloroform, with or without valerian internally, relieves moderate spasm, and is somewhat stimulating. Local counter-irritation, by issue, sinapism, or blister over the præcordium, or the actual cautery over the præcordium, or applied over the hepatic region in some cases, and the application of electricity, may be resorted to. Sometimes the local application of the hot-water bag is of service. Exercises given with extreme caution have in the writer's own hands sometimes given some relief to the acute symptoms.

To recapitulate, he wishes to emphasize that the treatment should not be haphazard, but systematic, if we would accomplish anything; and considering the suffering entailed by this disease and the danger involved, such attention upon our part is essential and called for.

First, we must remove exciting causes of every kind, and next relieve the visceral engorgement that has long existed because the heart was too weak and the vessels not elastic enough to keep up proper venous circulation; and having gotten rid of the *vis a tergo*, we relieve the capillaries by appropriate remedies and coincidently stimulate the heart, which can now act better because its capillary embargo has been raised. The success of the treatment depends upon the following out of the sequence just suggested. The comfort to be guaranteed to the patient, and the prolongation of life, are sufficient rewards for patient toil and scientific interest.

CAJUPUT OIL FOR CROUPOUS PNEUMONIA.

In the *Indian Medical Gazette* for December, 1896, SINHA reports that he has treated eighteen cases of pneumonia with oil of cajuput, with great success. He gives it in the dose of five drops in emulsion every four or five hours.

We note, however, that in several instances he continued its use with nux vomica and camphor and other drugs, which may have had much to do with the good effects produced.

A NOTE ON DECOMPOSITION OF CHLOROFORM AND SICKNESS.

In the London *Lancet* of January 23, 1897, NEWMAN and RAMSAY report the following interesting facts concerning the decomposition of chloroform and the development of illness subsequent to its use.

Early in the history of chloroform it was noticed that the agent had a tendency to undergo spontaneous decomposition on exposure to air and light, and although within recent years great care has been taken by manufacturers of the drug to produce as pure an article as possible, nevertheless the fact remains that chloroform is not stable and rapidly deteriorates as an anesthetic When freshly distilled chloroform is administered the vapor is easily inhaled, having a sweetish and not unpleasant taste and odor. It produces little or

no irritation in the air passages, little excitement of the patient is observed, and if the agent is carefully given sickness, fainting, and irregularity of the pulse and respiration seldom occur during its administration. But if chloroform is kept in a bottle containing air, exposed even to feeble light, changes are produced in the drug which render it less suitable as an anesthetic. The change is due to the formation of carbonyl chloride and hydrogen chloride, according to the equation $CHCl_3 + O = HCl + COCl_2$. These substances render the vapor slightly pungent in odor, and on inhalation it produces irritation in the air passages. The period of excitement of the patient is more marked, and the liability to sickness during and after anesthesia is greater.

During the last six months the effects of freshly distilled chloroform and of chloroform supplied in the ordinary way have been contrasted, greatly to the advantage of the former. It has been found, however, that distillation is not necessary, as by shaking the chloroform with slaked lime, and filtering, the irritating products of decomposition are eliminated, as indeed theory would predict; for the hydrochloric acid is of course at once acted on by the lime, giving calcium chloride and water, and the carbonyl chloride, to the presence of which the sickness is probably to be ascribed, is resolved into carbonate and chloride of calcium, thus $COCl_2 + Ca(OH)_2 = CaCO_3 + CaCl_2$. In illustration the three following cases may be mentioned:

Case I.—A man was operated upon on three occasions. For the first two the chloroform had been given in the wards for not more than ten days, and was kept in a well-stoppered bottle away from direct light; but the bottle contained some air. Each operation lasted fully an hour, and on both occasions the pulse became very irregular and feeble, so as to necessitate artificial respiration. While recovering from the effect of the chloroform he was very sick, and the sickness continued for two days after the first operation, and for three days after the second. The third operation lasted for one and a half hours. Chloroform which had been kept with slaked lime in it and filtered before use was employed. The patient, although much feebler through disease, remained well during the operation, and there was no sickness for twelve hours, when he suddenly became sick, but this passed off in a short time.

Case II.—A woman had been under chloroform four times, and she was invariably very sick while coming out and afterwards, the sickness lasting for twenty-four hours or more. When chloroform treated with lime was used, on coming out of the anesthetic sickness occurred for a few minutes only.

Case III.—A man was under chloroform four times. On the first and third chloroform as supplied by the druggist was used, and it was not more than twelve days old. After both operations there was severe sickness, lasting for thirty-six hours. On the second and fourth administrations freshly distilled chloroform was employed, with no sickness.

As a matter of experience it was found that freshly prepared chloroform is more reliable as an anesthetic, and is less likely to produce sickness during or after administration, and the risks of anesthesia are probably increased by the decomposition of chloroform when kept for any considerable time exposed to air and light. Even with fresh chloroform sickness may occur if the patient is allowed to come out during the operation, but the quantity of acrid mucus is very small in amount as compared with what is seen when older chloroform is given. Perfectly pure chloroform is said to be a much less stable body than chloroform containing alcohol. As an instance of the instability of pure chloroform it may be mentioned that a sample left in a half-full stoppered bottle from July till October, 1896, smelt as pungent as hydrochloric acid, gave with baryta water a copious precipitate of carbonate, and was absolutely irrespirable.

THE ACTION OF THE SUPRARENAL GLANDS.

An excellent summary of this subject is made by Stockman in the *Edinburgh Medical Journal* for February, 1897. As he states experimental researches on animals have shown that the subcutaneous and intravenous administration of suprarenal extract produces remarkable physiological effects. The active substance is contained in the medullary portion of the gland, and the activity of the extract has been shown by Fränkel (*Wiener Medicinische Blätter*, 1896) to run parallel with the distinctness of certain color reactions (*e.g.*, a green with ferric chloride), which are due to a substance which has not yet been isolated in a pure state. Moore has shown (*Proc. Physiol. Soc.*, London, 1895) that the active constituent is neither a proteid nor a carbohydrate, that it is not affected by acids nor by boiling for some minutes, but is de-

stroyed by alkalies, reducing agents, and prolonged boiling. It is not altered by artificial peptic digestion, and therefore, according to Oliver and Schäfer, preparations of the gland may be rationally given by the stomach, an opinion which has now been confirmed by therapeutical results. The active principle is readily extracted by water, glycerin, and weak alcohol, and is apparently a compound of pyrocatechin, as this body has been obtained from it by chemical decomposition (Mühlmann, *Deutsche Med. Wochnschr.*, Leipzig, 1896, No. 26). Oliver and Schäfer in an elaborate research (*Journal of Physiology*, Cambridge and London, vol. xviii, pp. 230–276) have shown that extracts made from the suprarenal glands of the calf, sheep, guinea pig, cat, dog and man have a similar action. Diseased glands from cases of Addison's disease were found by them to be inert. The doses used intravenously were equal to from one-fourth to three grains of the fresh gland, and the former dose exercised a marked physiological effect on the circulation of dogs. The active principle, whatever it is, must therefore be recognized as an exceedingly powerful body, if we reflect that of this one fourth of a grain about eighty per cent is water, and another very large proportion must consist of the proteids, etc., of the gland substance.

These authors found that the subcutaneous injection of large doses of extract (equal to fifteen grains of fresh gland) in dogs only produced a temporary stimulation of the heart and respiration, while the temperature was slightly raised. Rabbits died after smaller doses with symptoms of respiratory failure. They found that after intravenous injection of small doses the blood-pressure was raised to a remarkable degree, and this they attribute to a marked stimulation of the heart muscle and arterioles. The skeletal muscles were also stimulated, and hence they conclude that one function at least of the gland is to maintain tone in the voluntary and involuntary muscles by means of its secretion. In their opinion this view is strengthened by the fact that removal of the suprarenal bodies causes weakness of the heart and muscular system generally, with great want of tone in the vascular system.

Gottlieb (*Arch. für Exper. Path. und Pharmakol.*, Leipzig, 1896, bd. xxxviii) comes to the conclusion that the marked stimulation of the heart and arterioles is probably due to an action on their intrinsic nervous ganglia, rather than to a direct action on the muscular fibres. He states also, what had been previously observed by Cybulski, that administration of the extract by the mouth or subcutaneously had very little effect on the circulation, compared to what is observed after intravenous injection. The obvious inference is that the active principle is destroyed by the tissues. Previous researches by Pellacani and others had demonstrated that suprarenal extract was very poisonous to all kinds of animals, while Brown-Sequard, Tizzoni and others had shown by ablation experiments that the glands were essential to life, and that excision is followed sooner or later (four to thirty-six months) by emaciation, muscular weakness, and death. Pigmentation was observed in animals which died slowly, and the whole symptoms are analogous to those of Addison's disease in man.

A very complete critical summary of our knowledge of the suprarenal bodies and their relation to Addison's disease has been given by H. D. Rolleston in the Goulstonian Lectures for 1895 (*British Medical Journal*, London, 1895, vol. i), in which, after a very full discussion, much too long to be reproduced here, he concludes that Addison's disease may theoretically be dependent on (1) suprarenal inadequacy, or (2) chronic toxemia, due to non-removal from the blood by the suprarenal glands of toxic products of tissue metabolism. He is of opinion that the first view is alone tenable in the light of our present knowledge, and that the glands in Addison's disease fail to secrete a substance which is essential to health and life. What the exact function of their secretion may be is not yet known—whether its absence leads to a toxic condition of the blood which poisons the other tissues, or whether the want of it leads directly to an atonic state of the whole muscular system, are questions which for the present must be left open. These and many other important points, such as the origin of the pigment, are still very obscure, and further investigation may of course greatly modify our present opinions.

The treatment of Addison's disease by suprarenal glands and preparations has aroused considerable interest. Oliver has treated two cases with suprarenal preparations given by the mouth ("Pulse Gauging," 1895). He used pills in which one grain of dried extract corresponded to fifteen grains of the fresh gland, and an alcoholic solution of which one minim equaled one grain of gland. The results in both cases were encouraging: there was a gain in weight, lessening of pig-

mentation, and disappearance of nausea and anorexia. Rolleston states that a case of his has also greatly improved in much the same directions. He thinks that "a dose equal to forty-five grains of the original gland, spread over the twenty-four hours, is certainly not too much."

Stockton (*Medical News*, Philadelphia, 1895) gave two suprarenal capsules of the sheep daily raw, and after three months there was a very distinct improvement in the bronzing and in the general condition of his patient.

Lloyd Jones reports a case (*British Medical Journal*, London, 1895, vol. ii) in which suprarenal tabloids and extract were given, and where after four months' treatment "the excessive pigmentation has quite disappeared, and she appears to be practically well."

Dr. Sansom reports a doubtful case in which arsenic did no good, while the man improved greatly on two tabloids of suprarenal gland twice daily. When the treatment was discontinued the patient relapsed. In none of these cases is mention made of the probable lesion in the suprarenal glands.

M'Lauthlin (*Medical News*, Philadelphia, 1895) treated a case unsuccessfully with an extract, and after death fibro-caseous disease of the suprarenal bodies was found.

Sir Dyce Duckworth ("Twentieth Century Practice of Medicine") states that Sir Thomas Grainger Stewart has treated a case without any beneficial results.

The writer has had an opportunity of treating two cases of Addison's disease with suprarenal bodies. In one of these no improvement whatever occurred, and post-mortem tubercular changes in the lungs and suprarenal capsules were found. In the other, where the bronzing and general asthenia followed an injury to the back, marked improvement in the color of the skin and in the general condition took place in two months, when three and then six raw sheep's capsules were given daily. The improvement has now been maintained for twenty months under the constant administration of an extract. When it is omitted the patient relapses, but he is now able to follow his ordinary occupation.

Byrom Bramwell (*British Medical Journal*, London, 1897, vol. i) gives the details of a case in which after death the suprarenal bodies were found to be replaced by masses of fat. He was treated twice weekly by the hypodermic injection of a dose of extract, equal to a quarter of a rabbit's suprarenal capsule, and later a smaller dose was given every second day by the mouth. Marked improvement followed.

It may be noted that as yet no case has been reported in which complete and permanent recovery has taken place, although the subjective and objective symptoms are often very materially improved. Cases of fibro-caseous degeneration seem to derive no benefit, while those in which atrophy of the glands may reasonably be diagnosed give much better results.

Oliver (*British Medical Journal*, London, 1895, vol. ii), from his observations of the effects of suprarenal extract in contracting arterioles and from clinical observation, suggests that the extract may be usefully given in anemia, cyclic albuminuria, diabetes mellitus and insipidus, exophthalmic goitre, heart disease, and capillary hemorrhage.

THE TREATMENT OF CHILBLAINS.

M. GEORGE THIBIERGE contributes a long article on this subject to the *Journal des Praticiens* of January 9, of which the following is the substance:

Chilblains, he says, are always painful in a more or less marked degree; their development is preceded by pruritus and a sensation of heat and of pricking; after they have become established they are also accompanied by the same sensations, which are tolerable when the diseased parts are exposed to cold, and extremely painful when subjected to heat; changes from cold to heat, and frequently rest in bed, arouse and increase their intensity; this symptom is of great diagnostic value. Even simple pressure is extremely painful, however slight the lesions. To this may be added tumefactions and ulcerations, thus rendering chilblains veritable infirmaties.

Chilblains may be followed by a general tumefaction of the regions attacked, which is the result of local asphyxia even more than of the chilblains themselves. In the hands this tumefaction gives an entirely peculiar sausage-like aspect to the fingers, somewhat like that resulting from acromegaly.

Another consequence, still more rare, of chilblains is the production of localized and persistent vascular dilatations, true acquired capillary angeiomata, on which there are small papillomata resembling warts.

The erythematous congestion of the hands, or rather of the extremities, which in certain subjects appears when cold weather sets in, and is one of the forms of what is known as

Raynaud's disease, is an important predisposing cause. In young people the insufficiency of peripheral circulation which it causes should be attributed especially to the slight paralysis of the vaso-motor system; in older persons it arises principally from atheroma, which impedes the local circulation, the effects of which are further marked by weakness of the myocardium and by the blood dyscrasia depending upon senile interstitial nephritis. It must be noted, moreover, that this asphyxia of the extremities is not necessarily followed by chilblains, and that they may develop in non-asphyxiated regions.

Defective or insufficient alimentation singularly facilitates the development of chilblains; inactivity also helps their development; cold, aided by defective conditions of circulation and of the functions of the economy, is the cause of chilblains, and it exerts still greater effects when the skin is wet or not properly dried, or when it is suddenly succeeded by heat. Chilblains may often be prevented if the parts which have been exposed to the cold are slowly and progressively warmed; the vascular dilatation which provokes the too rapid return of heat is followed by a paralysis of the blood-vessels, which shows itself sometimes by erythema and sometimes by gangrene; this mechanism intervenes not only in the production of chilblains, but in that of the functional troubles which accompany them.

The conditions which predispose to the development of chilblains show what importance a general tonic medication should have in their treatment and their prophylaxis. Cod-liver oil, preparations of iodine, iron iodide, and arsenic are indicated in all cases, and their regular and prolonged employment often leads to the attenuation, in a very great proportion, of the tendency in certain subjects to chilblains.

Quinine sulphate often renders great service in an affection in which the circulatory troubles of the extremities play an indisputable part. M. Besnier recommended the prolonged employment of this medicament, with which he occasionally obtained unhoped-for results. M. Brocq found good results from the association of quinine sulphate and of ergotin in doses of from 0.75 of a grain to three grains with powdered digitalis (from 0.2 to 0.3 of a grain) and the extract of belladonna (from 0.03 to 0.06 of a grain) in the form of pills, the employment of which was prolonged during the entire winter.

Inhalations of oxygen, which accelerate nutritive changes and often give remarkable results in asphyxia of the extremities, are indicated in subjects in whom the sluggish condition of circulation predisposes them to chilblains.

Regular exercise, walking, gymnastics, cold affusions and general stimulating lotions are also extremely useful prophylactic means in the majority of subjects in whom a former experience has demonstrated their tendency to the development of this infirmity.

The part which local causes, and particularly the direct action of thermic agents, play in the development of chilblains furnishes prophylactic indications which should not be neglected. The hands should be covered with thick and sufficiently warm gloves, but rough woolen gloves should be avoided. They, like the feet, should be washed in warm water (not in cold) and carefully dried on a towel (never before a fire), and then powdered with starch or talc in order to remove every trace of dampness. The hands should not be allowed to remain too long in cold or soapy water. Shoes and stockings should be comfortably large, as the pressure of the foot on the shoe favors the action of the cold; they should be thick enough to protect the feet against the action of the cold, especially when there is snow on the ground. If sweating accompanies the chilblains, repeated foot-baths must be resorted to and the parts powdered with starch or talc to which has been added from one to two per cent. of salicylic acid.

Foot-stoves should be absolutely proscribed, and the feet should never be dried or warmed by a fire; if they are cold the best way to warm them is to rub them with a slightly warmed piece of flannel.

Foot-baths containing small quantities of astringent decoctions of walnut leaves, of ash leaves, of eucalyptus leaves, of oak bark, etc., of from five to six minutes' duration, constitute a very useful means of preventing frost-bites by increasing the resistance of the skin.

The employment of camphorated soap, or of a camphorated ointment (seventy-five grains of camphor and an ounce of vaselin), applied at night has often seemed efficacious to hinder the development of chilblains in subjects predisposed to them. The same results have been obtained by gentle friction with a piece of flannel saturated in strong spirit of camphor, according to M. Besnier.

If the lesions are not very intense, and

characterized only by red patches not very extensive and scarcely prominent, the preceding modes of treatment are indicated, particularly the local astringent baths, the camphorated preparations, and the absorbent powders. But if the lesions are pronounced, the patches large and prominent, these modes of treatment must be associated with or replaced by other topical agents, ointments, or collodion. The substances which are incorporated in them are intended to increase the consistence of the ointment, such as zinc oxide; or to allay the pruritus, such as opiates, carbolic acid, and menthol; or they are endowed with resolvent qualities, such as lead salts, of which the most commonly used is lead subacetate, which is anticnesmatic.

When the lesions are constituted by red elements, with little or no infiltration of the skin, zinc-oxide ointment such as the following, to which has been added a small quantity of carbolic acid or menthol, will suffice to allay the pruritus and cause the rapid disappearance of the lesions:

℞ Zinc oxide, 150 grains;
Carbolic acid, 8 grains;
Vaselin,
Lanolin, of each 225 grains.
M.

Another formula is this:

℞ Zinc oxide, 150 grains;
Menthol, from 3.5 to 4.5 grains;
Vaselin,
Lanolin, of each 225 grains.
M.

If the elements are more prominent, more inflamed, the preferable treatment is with an ointment containing lead salts, such as the following:

℞ Lead subacetate, 30 grains;
Carbolic acid, 8 grains;
Zinc oxide, 225 grains;
Vaselin,
Lanolin, of each 300 grains.
M.

Or the following formula may be employed:

℞ Lead subacetate, 30 grains:
Bismuth subnitrate, 90 grains;
Rousseau's laudanum, 15 grains;
Vaselin,
Lanolin,
Lard, of each 150 grains.
M.

These formulæ may be modified.

Simple elastic collodion, or collodion combined with iodine or salol, or better still the collodion made with acetone, which makes a better covering and does not produce the fissures which occur so frequently after the use of ordinary collodion, is an excellent protector for the diseased surfaces, and allays the pruritus; but it should never be applied to ulcerating chilblains or to those on which blisters have formed.

The following formula is recommended:

℞ Pyroxylin, 45 grains;
Acetone, 300 grains;
Ether,
Alcohol, of each 150 grains;
Castor oil, 60 grains.
M.

When the chilblains resist these topical applications, ointments containing silver nitrate, or painting with a fifty-per-cent. solution of silver nitrate or with the tincture of iodine, often hastens their resolution; these substances, however, cannot be used on the face, because of the discoloration they cause.

If blisters form they should be opened aseptically and covered with a dressing of vaselin and boric acid, or with freshly prepared Carron oil to which has been added two per cent. of carbolic acid. If these blisters have been ruptured, or the chilblains are ulcerated, after bathing the parts with a weak solution of corrosive sublimate they should be covered with a dressing of vaselin and boric acid or with non-irritating plasters, such as zinc oxide, simple boric acid, and dermatol plasters, or Vidal's red plaster. If the ulcerations do not disappear they should be touched every two days with a silver-nitrate stick, or with tincture of iodine, and dressed with camphorated brandy, with Van Swieten's liquor diluted one-half with water, or with aromatic wine. These dressings should be carefully applied, particularly on the toes and between the fingers, where, according to M. Besnier, it is well to place small tampons of absorbent cotton.—*New York Medical Journal*, Jan. 30, 1897.

PRESCRIPTIONS FOR TAPEWORM IN CHILDREN.

℞ Peppermint water, 2 ounces;
Ethereal extract of male-fern, 1¼ drachms;
Essence of turpentine, 15 minims;
Syrup of orange flowers, 1 ounce.

This is to be taken at one dose. It must be well shaken.

(We regard this dose of ethereal extract of male-fern as being too large).

Or in its place the following prescription may be employed:

℞ Syrup of mint, 6 drachms;
Castor oil, ½ ounce;
Ethereal extract of male-fern, 30 minims.

Or,

℞ Ethereal extract of male-fern, 1 drachm;
Calomel, 6 grains;
Gelatin or sugar, a sufficient quantity for one dose.

Or,

℞ Tamarind pulp, 1 ounce;
Powdered kamala, 1¼ drachms;
Lemon and sugar, a sufficient quantity to make a confection.

Or,

℞ Tincture of kamala, 2½ drachms;
Syrup of orange flowers, 1 ounce;
Peppermint water, 2½ ounces.
To be taken at one dose.

After the administration of any one of these prescriptions, unless a purgative is contained in them, from a dessertspoonful to a tablespoonful of castor oil or some senna should be given to remove the poisoned worm. —*Journal des Praticiens*, Dec. 12, 1896.

TAKA-DIASTASE: ITS USE IN CERTAIN FORMS OF DYSPEPSIA AND GOUT.

The *Liverpool Medico-Chirurgical Journal* for January, 1897, contains an article on Taka-Diastase as a digestive ferment written by Dr. WILLIAM ARMSTRONG. He points out that it has become so much a matter of routine to rely upon pepsin for the relief and cure of dyspepsia that the influence of the active principles of the salivary secretion on the process of digestion has been somewhat lost sight of. It is only when cases of acidity, flatulence, etc., are met with which resist the action of digestive ferments of the pepsin group that attention is specially directed to the influence of the primary digestive agent. He has been much interested, during the treatment of a large number of gouty patients, to find that although many of them had for months been deprived of almost all butcher's meat and other nitrogenous foods, the acidity, flatulence, digestive discomfort and general goutiness had gone on much as before.

Considerable light has been thrown on this subject by the success of the so-called "Salisbury" dietary; for under the exclusive use of red meat (aided by hot water drinking when the stomach is empty) many intractable cases of chronic gout and dyspepsia have been speedily and permanently relieved. This fact certainly points to one of two things—either that red meat is not the harmful agent in gout that many have supposed it to be, or, what he regards as more likely, that the admixture of the meat with the carbohydrates interferes with the due digestion of each.

The early loss of the masticating teeth, which we now so often find, the haste with which meals are so frequently taken, and more especially the custom of taking considerable quantities of hot fluids, such as tea, with food, give rise to a tendency to wash the food quickly down the first passages, and so prevent it being thoroughly mixed with the saliva; and thus, as the gastric juice has no converting influence over the starchy elements, they become decomposed, giving off a large quantity of gas and forming amylonptomaines, which are almost if not quite as harmful as those ptomaines formed from nitrogenous foods. The elimination of the starchy elements of the food is, however, a heavy price to pay for relief from the slighter functional symptoms; and it is not until serious disease becomes evident that patients will submit to this somewhat severe and irksome form of dietary, which, as it often causes considerable and rapid loss of weight, is not suitable for a large proportion of the cases met with in daily practice. As is well known, malt extract is a potent starch-converting agent, but the amount of contained sugar makes it a double-edged weapon, and it often does more harm than good in cases of gout and dyspepsia.

Some twelve months ago the writer was induced to give a trial to "Taka-Diastase"—a brown powder, free from odor, with a slight and not unpleasant taste, for which was claimed the power of converting one hundred times its weight of dry starch.

This powder was discovered by Mr. Takamine, a Japanese chemist, who, while studying in Glasgow, became greatly interested in the process of malting, which he came to consider as unduly tedious and costly. On returning to Japan he, with the assistance of Professor Atkinson, of Tokyo University, commenced a very exhaustive series of experiments, with a view to finding a class of plant capable of converting the starch in cereals into sugar, and the sugar into alcohol. He at last found what he required in the fungus of the species *Eurotium oryzæ*, belonging to the Aspergillus family. This microscopic fungus he cultivated on the flakes of hydrolized wheat bran, and succeeded in separating the diastatic and fermenting properties, so that either could be used without the other.

The writer has given the diastatic powder in doses of from three to five grains in a considerable number of cases, both of amylaceous dyspepsia and of the form of gout which seems

to be caused by that defect, and with excellent results. He has usually given it in powder with or immediately after meals, especially those with which much starchy food is taken; but it can also be given in mixtures, if neutral or slightly alkaline. Flatulence and acidity are greatly diminished, there is much less strain put upon the comparatively weak intestinal digestive processes, and the gouty symptoms are much relieved.

Taka-Diastase has never in the writer's experience caused the slightest discomfort, loss of appetite, or digesfive disturbance: the dose is so small, and the drug itself so free from unpleasantness, that patients take it readily.

The subjects of amylaceous dyspepsia should of course masticate their food slowly and completely, and should also avoid the taking of much fluid with meals,—such liquid as is necessary for the bodily processes being taken one hour before food, preferably in the form of hot water, and that required with meals being taken at the end thereof.

The author is convinced that in Taka-Diastase we have at command a remedy of the highest value, which is capable of giving excellent results in many obstinate cases of dyspepsia, auto-poisoning with amylon-ptomaines, and the resulting train of symptoms so frequently classed together under the names of latent and suppressed gout.

THE ABUSE OF "ASTRINGENTS" IN THE TREATMENT OF EYE DISEASES.

EDGAR A. BROWNE in the *Liverpool Medico-Chirurgical Journal* for January, 1897, says that the "astringents" in general use are the sulphates of zinc, alum, and copper, the chloride of zinc, nitrate of silver, and acetate of lead. The absence of sulphate of iron will be noticed from this list; nobody prescribes sulphate of iron for eye diseases, but it is extensively used for general purposes. Nothing could more clearly indicate the capricious and irrational mode in which these remedies have been adopted. Regarding these substances not as astringents but as antiseptics, the zinc sulphate may be regarded as of good general utility. It is popular, common, and cheap—all points in its favor. Against alum he has conceived a dislike—he can scarcely put his reasons in words. When he first joined the staff of the Liverpool Eye and Ear Infirmary, it was the remedy most in use. Seldom a case escaped it at some stage or other of its course. He has a distinct preference for the copper sulphate in the muco-purulent and purulent conjunctivitis that runs through schools, and in all early stages of trachoma. For mild cases of ophthalmia neonatorum the chloride of zinc has been used for many years. It will be remembered that it was one of the earliest antiseptics. Surgeons used to pump it freely into operation wounds; and it began to be used empirically, and not as an antiseptic. The true nature of ophthalmia neonatorum was not suspected. Though there are better, it may still be regarded as an excellent remedy, belonging to the most valuable class of chlorine compounds, whence come many of our best disinfectants. It has the disadvantage of being extremely irritating. If used at all too strong it causes the lids to swell, and gives rise to a copious discharge of mucus. This can be verified on the healthy eye.

The writer has already referred to the discharge of mucus as disadvantageous. It is so because it forms a habitat peculiarly suited for germ culture. An antiseptic that gives rise to mucus partially defeats its own object. It is in the removal of this favorable soil that lotions of boracic acid or borax prove useful. They act as detergents, their antiseptic power being feeble in the extreme.

Nitrate of silver cannot be dispensed with in the routine treatment of severe purulent ophthalmia in the adult or the new born. The conjunctiva will stand a good deal of the nitrate, but the cornea is extremely intolerant of it. If the epithelium is abraded, or ulceration occurs, it gives rise to white opacities. For reasons which cannot conveniently be detailed here, it seems to exercise an unfavorable influence on corneal ulceration. If used, too much care cannot be exercised in applying it religiously to the whole surface of the inflamed conjunctiva. Generally it is flooded on the cornea where it is not wanted, and it never reaches the superior conjunctival culde-sac where it is essential.

A few words on antiseptics which have no spurious reputation as "antiseptics" to create confusion: The perchloride of mercury has a good clinical and laboratory reputation; it has the advantage of being cheap and readily procurable, a great point in the treatment of common and wide-spread diseases; it may be used in solutions of from 1-to-5000 to 1-to-10,000 in all forms of ophthalmia, and as a precautionary lotion; it has the disadvantage of being irritating, and occasionally giving rise to permanent white opacities of the cornea. This is especially the case when cocaine is used, and many surgeons are aware

of the drawback in cataract extractions. The writer has seen two cases of ophthalmia neonatorum, where the cornea was covered with dense dotted white opacities, due to the action of the perchloride.

A better remedy is the oxycyanide of mercury, which may be used in solutions of 1-to-500 or 1-to-3000. It is not kept by many chemists. Browne has never seen nor heard of its causing any opacification of the cornea; and it does not, if cautiously used, injure instruments. It is extremely efficacious in all muco-purulent cases. Panas' solution of the biniodide of mercury is of great utility, and seems to possess more rapid penetrating power than the foregoing, and therefore is applicable to cases with corneal complications. It smarts a good deal, but gives rise to little permanent irritation, even if applied to ulcerated surfaces.

Antiseptic remedies that may be trusted to infiltrate the cornea, and pass into its substance or the interior of the eyeball, are much to be desired. Atropine, eserine, and their homologues are manifestly absorbed in a few minutes, but they have not even the feeblest antiseptic powers. The only two drugs to be at all depended on are quinine and pyoktanin. Both are absorbed slowly, but still they are absorbed, and have been observed modifying the appearance of the tissues.

Eyes that have been copiously treated with quinine have been known to present the peculiar bluish fluorescence characteristic of the drug in solution. Mr. Mackinley showed a case of a man—who if not born in the purple at least lived in it, at an aniline dye factory—whose cornea (and other tissues) were deeply tinted like stained glass. Neither drug can be rated high as antiseptics, but they are extremely useful in infiltrations and ulcerations of the cornea. So also may it be said of the time-honored remedy—the yellow oxide of mercury. This is one of our most valuable applications in chronic cases, but exceedingly treacherous. Its quality varies extraordinarily. Some samples irritate to a remarkable degree. Nothing in the external appearance has come under the writer's observation that might serve as a warning, but there are certainly subtle differences in the chemical constitution of the drug, as well as variations in the sensitiveness of the patients. With all its drawbacks, it has a wide range of utility. Remedies superior to the foregoing may be, probably will be, discovered. Even if that day arrives, we shall benefit but little if an empiric and routine treatment remains the rule. The foundation of all rational treatment is twofold: (1) diagnosis; and (2) a knowledge of the pathology and natural course of the affection. It is no use trying to learn about drugs if we don't know the diseases. We may prescribe the very latest of the coal-tar derivatives of the *fin-de-siècle* advertising druggist, and be no better intellectually than the apothecary of the Middle Ages.

THE ADMINISTRATION OF CREOSOTE.

The *Journal des Praticiens* of December 12, 1896, recommends the following formula for the administration of creosote, the prescription being put up in cachets:

℞ Creosote,
Benzoin, of each 15 grains;
Powdered charcoal, 1½ drachms.

Triturate the creosote and the benzoin for a moment together and add by degrees the charcoal. This mass is then to be divided into five or ten cachets, each one of which will contain a proper dose. It is claimed that this prescription is very well borne by the stomach.

A PRESCRIPTION FOR INTERCOSTAL NEURALGIA.

According to the *Journal des Praticiens* of December 12, 1896, CHERON recommends the following prescription for intercostal neuralgia associated with uterine disturbances:

℞ Tincture of gelsemium, 100 drops;
Simple syrup, 1½ ounces;
Distilled water, 6 drachms.

Of this two to three teaspoonfuls may be taken twice or thrice a day.

[Such a prescription ought not to be used if the heart is at all feeble.—ED.]

AMYLIFORM.

Amyliform is a combination of formaldehyde and starch and is a white powder, without odor, insoluble in all liquids. It is, however, very stable and not easily altered. In the body it is decomposed slowly into formic aldehyde and starch. As is well known formic aldehyde is a useful bactericide, antifermentative and antiputrefactive, and it is stated that amyliform lends itself readily to the purposes of antiseptic surgery. Employed as a powder it diminishes in a rapid manner the secretions upon sores, particularly those which have a bad odor.

Langgard, who has used it both in major

and minor surgery, has never observed any symptoms of intoxication or local irritation from its use, such as sometimes follows the use of iodoform.—*Journal des Praticiens*, Dec. 12, 1896.

PLANTAR NEURALGIA.

JONES (*Liverpool Medico-Chirurgical Journal*, No. 32, 1897) calls attention to the silence of most text-books concerning this comparatively common and extremely obstinate complaint, and states that the discovery, description and treatment of the affection are almost entirely to be ascribed to American surgeons.

The disease may be defined as a painful affection of the plantar digital nerves, increased by pressure and usually located near the fourth phalangeal joint. The arches of the foot are usually described as two in number — the longitudinal and the transverse. The longitudinal may be considered to consist of two arches, an inner and an outer. The inner arch consists of the os calcis, scaphoid, three cuneiform bones, and the three inner metatarsal bones; the outer is made up of the os calcis, cuboid, and two outer metatarsals. The transverse arch is formed of the cuboid and cuneiform bones. The longitudinal arch has its concavity directed downward, and the transverse downward and inward. The two arches, longitudinal and transverse, taken together make up a semi-dome, and a part and parcel of the single structure. This semi-dome is opened internally, but closed behind externally and in front, and has its highest portion at the midtarsal articulation; thus the two feet placed together make a single dome.

These arches of the foot are essentially connected with the upright position. The weight of the body coming down the tibia enters the astragalus, the pressure points of which are directed downward and backward, and downward and forward. By the downward and backward lamellæ the weight of the body is continued to the ground through the os calcis and the heel, but the forward and downward carry it to the ground by the os calcis, cuboid, and metatarsal bones, all of which show definite pressure lamellæ. Taking the view that the arches are not separate, but merely integral portions of a whole, one is prepared to find that, along with a flattening of the longitudinal arch, the transverse arch is always affected, and *vice versa*. This statement can be proved to be correct by clinical observation. Associated with this must be noticed the relative position of the heads of the metatarsal bones to one another. In a coronal antero-posterior section of a frozen foot, their position was: second in front of first by ¼ inch; third behind second by ¼ inch; fourth behind third by ¼ inch; fifth behind fourth by ⅜ inch.

The head of fourth and that of fifth are considerably behind the preceding toe. Furthermore, one should note that the fourth branch of the internal plantar nerve communicates with the superficial division of the external plantar, and divides to supply the adjacent sides of the third and fourth toes. The position of this superficial division of the external plantar is of importance in the production of the pressure neuralgia of which this paper treats. In their course toward the toes the digital nerves, before they divide into the two nerves which will supply the contiguous sides of two adjacent toes, lie between, but not deeply between, the heads of the metatarsal bones. The fourth metatarso-phalangeal generally, but not invariably, is the affected joint; and Morton, in his original description of its pathology, advances a very plausible but only partially correct theory of its etiology. He says that the metatarso-phalangeal joints of the first, second and third toes are found on almost a direct line with each other, while the head of the fourth metatarsal is from one-eighth to one fourth of an inch behind the head of the third, and the head of the fifth is from three-eighths to half an inch behind the head of the fourth: the joint of the third, therefore, is slightly in advance of the joint of the fourth, and the joint of the fifth is considerably behind the joint of the fourth.

The fifth metatarsal joint is so much posterior to the fourth that the base of first phalanx of the little toe is brought on a line with the head and neck of the fourth metatarsal, the head of the fifth metatarsal being opposed to the head of the fourth. On account of the character of the peculiar tarsal articulation, there is very slight lateral motion in the first three metatarsal bones. The fourth has greater mobility, the fifth still more than the fourth, and in this respect resembles the fifth metacarpal. Lateral pressure brings the head of the fifth metatarsal and the phalanx of the little toe into direct contact with the head and neck of the fourth metatarsal, and to some extent the extremity of the fifth metatarsal rolls above or under the fourth metatarsal. The mechanism of the affection, Morton asserts, becomes appar-

ent when the nerve-supply of the parts is considered. The branches of the external plantar nerve are fully distributed to the little toe and to the outer side of the fourth; there are also numerous branches of this nerve deeply lodged between these toes, and they are liable, Morton argues, not only to be unduly compressed, but pinched by a sudden twist of the anterior part of the foot. Any foot movement which may suddenly displace the toes when confined in a shoe may, he adds, induce an attack of this neuralgia.

Passing from the anatomy to a clinical description, three varieties may be described: (*a*) Plantar neuralgia of the first degree; (*b*) plantar neuralgia of the second degree; (*c*) plantar neuralgia of the third degree.

(*a*) In the first class one would comprise those cases where pain is occasionally felt along the metatarso-phalangeal joints during the performance of certain acts, but is immediately recovered from on desisting from such acts. In this stage there is no pain on pressing the spot. This stage is very common, and many readers will recall their own experiences in dancing or riding. It is a very usual complaint of the dancer that he has to rest because of aching behind his toes, and who of us has not met with the horseman anxious to rest his painful foot by riding without stirrups? In occupations where the body-weight falls on the anterior part of the foot, the affection is frequent, more especially where slippers or thin-soled boots are used.

(*b*) Those cases where characteristic symptoms quickly follow early attempts at walking after injury, due probably to a painful yielding of the transverse arch. The following case will represent a type of this variety: A young lady of twenty-four, of weak ligament type, whilst patting a horse after a ride, was trodden upon by it. The foot was considerably swollen, not very painful, and no lesion worse than pressure-bruising could be observed. She laid up for a week, and then walked about in house-boots or slippers. In less than three weeks she complained of considerable pain behind the fourth and fifth toes, and frequently had to rest. The pain subsided however almost immediately on abstaining from walking or standing. This pain lasted two months, and only left her when appropriate mechanical treatment was employed.

(*c*) The third or severe variety comprises those cases where symptoms appear idiopathically or remotely after injury, are persistent in character, do not yield to mechanical measures, and to all effect cripple the patient.

From an analysis of the foregoing cases one is enabled to formulate certain symptoms as constant, others as common, and some as exceptional. In all the cases a complaint was made of pain on walking. This pain was different in character from that of the so-called painful spasm of flatfoot, inasmuch as the pain in metatarsalgia is, in its intense area, strictly localized, while it is generally much more severe and paroxysmal. The painful flatfoot is oftenest found in the cold and bluish foot, while Morton's disease appears to be associated with healthy nutrition. In the milder varieties pressure has to be continued for a time before pain is manifest; in the severe cases less pressure produces much greater pain. In the first and second varieties the pain is neither so acute nor spasmodic as in the third. In all the reporter's cases there was pain on pressing either on the second, third, or fourth metatarso-phalangeals, and in the majority of cases opposite the fourth alone was the painful spot. This painful spot was in all cases best displayed by pinching the articulation between the finger and thumb. This could be effectively done without interfering with any of the other metatarsals, and is suggestive that Morton's explanation of the anatomy is not the whole truth. If the condition is usually accompanied by a broadened foot, due to a collapsing anterior arch during the act of walking, there would be separation rather than approximation of the metatarsal heads. Furthermore, if Morton's grinding theory is to explain all, why should a localized pinching applied to the metatarso-phalangeal alone give rise to pain. A radiograph may exhibit the broken line of metatarso-phalangeals, with the fourth as chief offender; but even making all allowances for the position of this articulation, it is not easy to conceive of a pure nipping of nerve as taking place where there is so much interspace. Taking into consideration also the fact that in thirteen cases grasping the front part of the foot in the hand gave relief, it is not in accordance with the theory of lateral pressure advanced by Morton, as such manipulation should increase, and not decrease, the paroxysm.

The explanation of the pain, having regard to the free mobility of the fourth and fifth, is much more probably a stretching or pressing upon rather than a nipping of nerve, and would accord more harmoniously with (*a*) yielding of the anterior arch; (*b*) relief experienced by circular compression; (*c*) pain

on local pressure. It is a theory which better accords with the exceptional instances of pain over the second and third joints. The mobility of the fourth and fifth allows of greater stretching when the transverse arch yields, and hence the frequency with which these joints initiate the trouble. Furthermore, most pressure in standing is placed upon the first and fourth metatarsal heads, while the frequency with which relief was obtained by frequently flexing the toes, which involves a lifting of the metatarsals, confirms one's belief that nerve pressure is the correct explanation of the lesion. In thirteen of the seventeen cases there was flattening of both arches. This suggests a weak ligamentous structure, and a stretching of the soft tissues of the waist of the foot. In thirteen out of seventeen cases circular compression below the instep gave relief. By this means, doubtless, the arch would be restored and the tissues of the sole relaxed. In the seven cases where a click in the joint gave a marked measure of relief, some subluxation — confirmed by lax ligaments — was suspected, but in only one case could the click be produced by manipulation.

That some neuritis is present in the severe varieties is suggested by the acute character of the pain, and by the statement volunteered by many that it felt like treading on something hot, and by the change sometimes noted in the nutrition of the toe. Particularly suggestive is the practice, during all stages of the affection, of rapidly flexing the toes; an act which cannot be performed without elevating the metatarsals, and relaxing the digital nerves from pressure and stretching.

Placing in order of frequency, symptoms which the author's cases have exhibited:

(*a*) Pain over metatarso-phalangeal region on standing or walking, only slightly relieved by mechanical contrivances.

(*b*) Pain on pinching the fourth metatarso-phalangeal.

(*c*) Relief of pain on circumferential pressure around base of toes, assisted still further by repeatedly flexing the toes.

(*d*) Sensation of walking on something hot.

(*e*) Presence generally of flattened arches of the foot.

In nearly all the cases reported prolonged treatment elsewhere had been adopted; and the complaint was generally ascribed to gout, rheumatism, or hysteria. We know how stretched or otherwise injured structures will tempt a visit from any of the three diatheses; but apart from this possibility there was no evidence of its existence in the great majority of cases. In not one case was there any symptom of hysteria.

From an analysis of symptoms in seventeen cases it will be noted: That there was a history of injury in ten cases; that the third as well as the fourth joint was affected in three cases; that lateral pressure gave relief in fourteen; that reference was made to subluxation or reduction with click in seven; that there was flattening of both longitudinal and transverse arches in twelve; that ten patients were women, seven men; that three described sensation as if standing on something hot; that the ages ranged from twenty-four to fifty-eight, ten being between thirty and forty; that in one case symptoms were induced by pressure of callosities due to fracture; that in one case symptoms were induced by small fibroma of plantar fascia; that symptoms of gout, rheumatism, or hysteria were only found in two cases; that flexion of toes in the majority of cases was productive of relief.

The author's reasons for dissenting from the theory of causation as advanced by Morton may be summarized as follows:

1. The plantar digital nerves, instead of passing between the heads, lie on the transverse metatarsal ligaments, and when the foot is pressed upon, are pushed away from, not between, the bones.

2. It is not proved that the anatomical position of the heads of the third, fourth and fifth metatarsals is favorable to a nipping of the nerve on lateral pressure; on the contrary, there would be less escape were the metatarsal heads in absolute line.

3. That in the majority of cases a painful spot can be found and made intensely sensitive by pinching with the thumb on the dorsal and the forefinger on the plantar surfaces; that such spot is usually quite local, and would not respond to such pressure if, as asserted, the pinched and sensitive nerve were placed between the bones.

4. That in most cases a broadened foot, due to collapse of the anterior arch, accompanies the affection, rendering the digital nerves less liable to compression. This fact, in conjunction with another, viz., that a broad soled boot hardly gives any relief in the third degree of plantar neuralgia, is strongly at variance with Morton's theory.

5. That in a large number of cases grasping the foot around the metatarsal heads, thus approximating them, relieves the spasm.

6. That frequent flexing of the toes is an instinctive method of relieving spasm, the flexing of the toes being accompanied by slight approximation of metatarsal heads.

7. That manipulations of the foot by the surgeon, other than applying direct local pressure, rarely produce the pain.

Clinical observations accord much better with a theory of treading upon, rather than with that of pinching, a nerve; three anatomical facts strengthen this theory:

(*a*) The proximity to the painful area of the communicating fourth branch of the superficial division of the external plantar.

(*b*) The collapse of the anterior arch in most of the cases.

(*c*) The bulk of superincumbent body-weight in walking on the toes is borne on the first and fourth joints.

Tubby, in describing his cases, draws attention to the existence of corns over the painful areas. In not one of the writer's cases was this noticeable. When corns are found, however, they simply denote pressure-spots, and are situated over bony prominences. They point to pressure upon the nerve between the corn and articulation, and support the theory the author advances in contradistinction to the nipping of nerve between bone. His cases of plantar neuralgia due to fibroma of the plantar fascia and fracture of the metatarsal bone equally support his contention. Gibney, in an interesting article in the *Journal of Nervous and Mental Diseases*, states that if the bases of the metatarsal bones are tightly grasped, the distal ends are separated, and the nerves are no longer compressed. The writer's experiments do not bear out the conclusion Gibney has recorded; and even were it otherwise, the majority of patients obtain relief not by compressing the bases, but by compressing the heads, of the metatarsals.

If any normal foot be examined one will find that the two prominent spots upon which most of the body pressure is borne are opposite the first and fourth metatarsal joints. The fifth is also prominent, but is so mobile that it can be easily pushed to one side. This is a strong reason, therefore, why the fourth metatarsal should most frequently supply the painful area. The third and fourth become affected generally in cases of collapse of the anterior arch, where, instead of being concave on the plantar aspects, the metatarsals present a convexity, the second and third articulations forming the most prominent portion of the convexity.

From the persistence of pain in certain cases, even after pressure has been withdrawn, and from the immediate sensitiveness when walking is practiced, one is inclined to believe that a neuritis of the plantar nerves involved exists in the more acute cases. This view is confirmed by the fact that even after a long rest, pinching the spot between the finger and thumb gives rise to severe pain.

The treatment of plantar neuralgia must vary with the stage of the affection. In the first stage the patient will do well to take the warning given, and by appropriate precautions prevent the development of the affection. This is done by attention to certain details:

(*a*) To abstain from continuing any action which produces the pain.

(*b*) To increase the depth of the inner aspect of heel, in order to produce slight inversion of foot.

(*c*) To wear thick soles, with well-fitting insteps, and roomy around the heads of the metatarsals.

(*d*) To insist that the sole be at least one-fourth of an inch thicker a little behind the bases of the metatarsals.

The preventive methods as applied in the first stage should also be directed to the cure of the second stage, with certain additions. These additions may be any or all of the following measures:

(*a*) A thick bar placed about half an inch behind the metatarsal heads.

(*b*) A band of non-irritating plaster around the instep.

(*c*) Massage of foot, with contrast baths of hot and cold water.

(*d*) Elevation of the foot of the bed at night.

The advantage of thick-soled boots is obvious; they prevent excessive mobility at the articulation, and minimize sharp bony pressure upon the nerves. The boots should be roomy at the toes, not merely to give more room to the metatarsal heads, but to allow freedom to flex the toes, and to perform other movements to avoid pain. The heel of the boot is slanted to correct the common tendency to valgus and to vary the pressure point. In cases where there is no collapse of the arch the heel may with advantage be elevated on the outer side to deviate body pressure.

Most important of all, however, is the thickening of the sole in the early cases (or bar in later) behind the metatarsal heads. This gives rest to the articulation, even during the act of walking, and is of more ad-

vantage than any other mechanical detail of treatment. This alteration, even in the case of inflamed or gouty toe-joint, allows the patient to travel in comparative comfort, and should always be prescribed in all the stages of plantar neuralgia—for a time even in those cases where an operation has been performed.

In the third stage of the affection nothing short of an operation is satisfactory. By this it is not meant that on no occasion can an advanced case be relieved by mechanical measures; on the contrary it can, and often is. But operative measures are so safe and simple, and other measures so prolonged and troublesome, that most patients do not hesitate which course to accept. Of operations, only three are radical and efficient: (*a*) Exsection of metatarsal head; (*b*) excision of joint; (*c*) amputation of metatarsal head and toe.

Short of these radical measures, we may employ any or all of the following methods: (1) Actual cautery; (2) heated needle into painful site, to destroy nerve; (3) hypodermic injections of carbolic acid; (4) part exsection of digital plantar nerve.

It will be noted that each of these surgical practices involves the plantar or walking aspect of the foot, a fact which seriously modifies its utility.

Of the radical operations, he strongly advocates the superiority of exsection over excision and amputation. It is simple, safe, and sure, and can be performed in the following way:

After the part has been carefully aseptic-ized an incision should be made a little over an inch in length, starting above the metatarso-phalangeal joint, and extending over the middle line of the toe. The extensor tendon is divided, the capsule opened, and the head of the metatarsal dissected out by a blunt instrument. With fine bone nippers the head is removed and the flexor tendon below divided. The wound is then stitched, and as a rule no vessels need securing. The after-treatment consists in keeping the patient in bed for about ten days, with the foot elevated. Massage should then be commenced, and the patient, with a bar under the foot, allowed to walk. There is usually nothing to hinder complete recovery in from five to six weeks, when boots such as earlier described should be prescribed.

DETECTION OF STONE IN THE BLADDER.

WILLIAM K. OTIS (*Journal of Cutaneous and Genito-Urinary Diseases*, February, 1897) presents an instructive paper on the subject of stone in the bladder. The detection of stone in the urinary bladder is ordinarily a simple matter, presenting no extraordinary difficulties to the surgeon of average ability; but occasionally cases do occur in which the most skilful and experienced operators find themselves unable to establish a diagnosis in spite of every means at command. Stones, even of a large size, have escaped the most careful and minute examination by some of the most celebrated surgeons both of America and Europe. In actual practice the presence of stone is so frequently overlooked, especially when it complicates some other pathological condition of the bladder, that a thorough discussion of the various methods we have at our disposal for the detection of stone, and the relative utility of each, is timely.

The rational symptoms presented by patients with stone in the bladder are exceedingly variable in degree; they may all exist together, or one or more only may be present; or, even when the stone is of large size, there may be an entire absence of symptoms; or any or all of these symptoms may occur without the presence of stone. Otis calls attention to the fact that pain is usually the initial symptom, together with disturbances of micturition, and sooner or later cystitis almost invariably develops. Examination of the urine may demonstrate a larger amount of albumen present than would be accounted for by the amount of pus, although there may be no other indication of disease of the kidney, and this albumen will disappear after removal of the stone. Hemorrhage caused by the traumatic action of the stone on the bladder walls is a most frequent symptom, and according to Ultzmann always exists, though blood may not be present in sufficient amount to be visible to the naked eye. The bleeding usually occurs at the end of urination, and is more profuse after violent exercise. In cases of old patients with congestion of the prostate or hemophilia bleeding may become a very serious complication.

The author then refers to the value of the microscope as an aid to diagnosis in demonstrating the presence of crystals of lime oxalate, uric acid, or triple phosphate, indicating the nature of the stone, and the existence of pus and blood-cells, which may not be present in sufficient quantity to be recognized by the naked eye.

The history of the patient may give a clue as to the probability of the presence of stone.

Thus there may have been previous attacks of renal colic, in which one or more calculi were unaccounted for, pieces of catheter or bougies broken off in the bladder, the introduction of foreign bodies through the urethra, or through wounds of the bladder, or necrosis of neighboring bones, pieces of which may have ulcerated into the bladder and formed the nucleus for a stone.

Physical signs may exist without the presence of stone, and while they are exceedingly valuable, other methods are necessary to establish a positive diagnosis.

The most important method, giving definite information and easiest of application, is the use of the metallic sound or searcher. This instrument in general should be of small calibre, 15–20 F., have a short curve, in order that it may be readily rotated in the bladder, easily turned down behind a projecting prostate gland, and should be of sufficient weight to give it firmness in the hand. The presence of stone is definitely determined either by the sense of touch or an audible click given when the point of the instrument strikes the stone. Oxalates and urates give a loud, clear note, while phosphates and cystin stones only a feeble friction sound. There are many designs in the form of the searcher, differing from each other in more or less important particulars. The form most commonly used is one originated in 1860 by Sir Henry Thompson. This instrument consists of a silver catheter of 15 F., with a shaft ten inches long, having very thick walls to give the desirable weight, the eye being on the convex surface at its juncture with the staff. The curve is short, and the distal end slightly bulbous in form. The proximal end, or handle, consists of a roughened cylinder, one-half inch in diameter and two inches in length, to facilitate motion of the instrument. A scale with a slide is marked at this end of the instrument, to enable the operator to measure the size of stone. At the extreme end is placed a stopcock to control the flow of fluid from the bladder. In 1891, despite the popularity of this instrument, Sir Henry became dissatisfied with it, especially with its ability to detect very small stones, the importance of which is so great to the patient, as they can then be removed with comparatively little risk; while if they are allowed to remain they are sure to increase in size, with a corresponding increase in the danger of removal. Sir Henry says: "There are two chief considerations to be borne in mind in designing such an instrument: first, it should be so formed that all the necessary movements can be made with facility; that (*a*) the operator may pass it easily into the bladder and also know with certainty the direction of the beak when lost to view; and (*b*) that he should be able to rotate it with ease between the finger and thumb, when the beak is turned downward behind the neck of the bladder, especially when from enlargement of the prostate the well known depression exists there in which calculus is likely to lodge." The first condition is attained by using the flattened handle of a good old pattern; the second by placing close to it a small cylinder, a combination which now appears better than the entirely cylindrical handle which he originally introduced for lithotrites and sounds for the purpose named. The shaft of the sound should be rather slender, and the upper surface of the flat handle rough, while the lower is polished, so that the direction of the beak (upward or downward) is recognized by touch.

"Secondly, there should be special adaptation in the form of the beak to strike a very small concretion, and elicit a note therefrom. This is accomplished by flattening the beak a little in the opposite plane to that of the flat handle. It must be manifest to all on consideration that, long as we have been contented to employ a beak of cylindrical contour, this form is especially adapted to avoid direct impact on encountering a small calculus, since these bodies have mostly a nearly spheroidal or ovoid form, and naturally glance off when contact occurs." In fact, a blade flattened in the direction above described is more certain than a cylindrical one to make direct contact, and will transmit to the operator a greater sense of resistance and a more audible note. The wider measurement at the beak which he employs for ordinary purposes may be from 20–22 F., the narrower about 14–15, becoming a little thicker, though still flattened, toward the extremity. Such an instrument passes easily into any fairly healthy urethra, and in the presence of most forms of enlarged prostate, with rather increased facility in comparison with the ordinary form. It should never be forgotten in connection with seeking a small calculus that the dense fluid medium in which our instrument acts greatly increases the difficulty, as compared with the same action occurring in air, of obtaining rapid and direct contact with a small body of which the specific gravity is comparatively light; hence the need of flatness

and breadth of surface to ensure a direct blow, and the means of moving rapidly to ensure an audible note. It will be seen, however, that in this form of instrument the originator, in order to obtain solidity and distinctness of note, has abandoned one of the principal features which made his original searcher valuable — the ability to control the amount of fluid in the bladder, the instrument remaining *in situ*. In order to re-establish this advantage Otis has designed a searcher which exhibits all the points of Thompson's latest model, except that the shaft is hollow, the lumen being completely filled by a closely-fitting, polished rod connected with the flat portion of the handle, and held firmly in place by a bayonet catch. By this means all the firmness and weight of the solid instrument are retained, while if it becomes desirable at any time during the examination to vary the amount of fluid in the bladder, this may readily be done by removing the rod and allowing it to escape, or injecting a larger quantity.

Attempts to increase the volume of sound made by striking the stone are open to the objection that the added appliance makes the handling of the sound awkward. In certain cases the instrument may be made so sensitive that indications of stone are detected when none is present. The position of the patient is of importance. He should first be sounded while lying down, then standing, finally in the Trendelenburg position. Sometimes it is advisable to have him turn from one side to the other. The knee-elbow position may cause the stone to drop within reach. The bladder should usually contain about four ounces and should be examined both empty and distended. If the patient is hypersensitive the injection of choice is a ½-per-cent. solution of cocaine, followed by instillation of four-per-cent. solution into the posterior deep urethra.

A favorite seat for calculus is the cavity of the bladder lying deeply behind the prostate, toward the cæcum. Ultzmann found that in eight out of ten cases in old men the calculi lodged in this region, and states that this pouch is due to the pressure of feces in the rectum which causes the entire bladder to be shifted towards the right and lifted and turned around its longitudinal axis.

The searcher enables us to determine the condition of the bladder walls, the mobility of the stone and its approximate size. The diameter is best determined by a small lithotrite. This instrument also enables us to determine its chemical composition. An oxalate calculus will not yield. The shell of the urate stones is crushed, whilst the teeth sink readily into phosphatic or cystin calculi. On the teeth of the lithotrite will be found sufficient of the stone for chemical analysis.

When the presence of several stones is suspected the lithotrite should seize the one most easily grasped; it is then rotated and moved about in the bladder, when the operator can readily determine whether or not it comes in contact with other hard bodies.

The reasons for failure to detect stone in the bladder with searcher are: failure to introduce the instrument properly, the operator mistaking an enlarged prostatic sinus for the cavity of the bladder; low specific gravity of the stone, so that it flies away from the searcher without giving sufficient impact to be felt or heard; coating of the stone with mucous or blood-clots so that the characteristic sound and touch are absent, the condition being mistaken for a ruga of the bladder wall; encysted stone, where only a small portion may present in the bladder; and stones hidden in sacculations or pouches.

Mr. Buxton Browne has particularly pointed out a not uncommon and particularly annoying variety of the latter, which he terms the post-prostatic pouch, which consists in the horizontal portion of the trigonum of the bladder being pushed down between the enlarged projecting prostate in front, and a thickened and firm interureteral ridge behind. Where there is much intravesical prostatic projection the pouch may literally be roofed over by this prostatic outgrowth. Calculi in this pouch cause much pain, as the trigonum of the bladder has a larger nerve supply than any other portion. Lying as this pouch does in front of and below the orifices of the ureters, it is a perfectly-contrived trap for catching and retaining renal calculi upon their entrance into the bladder, and it is readily seen how favorably they are placed there for growth. If such a condition is suspected the beak of the instrument should not merely be reversed, but a thorough examination should be made of this extremity for the slit-like opening between the intravesical prostatic growth and the interureteral ridge, which may be the sole means of access to the large prostatic pouch. Browne has designed a sound with a beak like a flat-bladed lithotrite to make this investigation. It slips with great facility behind the projecting lobe of the prostate, allowing the place to be as fully

explored as is possible with any instrument passed into the natural channel.

Digital pressure through the rectum sometimes affords help in this exploration. Bimanual palpation is an extremely valuable means of detecting large calculi, and for finding small fragments the lithotrite tube and an aspirator are useful. The cystoscope is serviceable in cases in which its introduction is possible. In certain cases the diagnosis can only be cleared up by cystotomy. Should this be indicated the suprapubic operation is the one of choice.

SURGERY OF THE LUNG.

In the year 1710, nearly two centuries ago, Baglivus suggested that cavities in the lung might be successfully treated by operation. During the next century and a half an occasional operation was performed for the relief of pulmonary affections, but the surgery of the lung was unsystematic and largely experimental until Graux in 1850 reported the results of thirteen operations. All these cases were unsuccessful, however, and these results combined with other similar failures retarded the progress of pulmonary surgery for another quarter of a century.

A fresh impulse was given to this branch of surgery some fifteen or twenty years ago, when numerous successful experiments on animals, where portions of the lung, and even entire lobes, were excised, led to the hope that the same success might follow operations on the human lung. This expectation, however, has not been fully realized. Especially is this true in regard to tubercular process, which would offer a vast field for operative interference were success to follow such treatment. In this class of cases there seems to be but little hope of benefit to be derived from excision of tubercular foci. Reclus, in a most admirable address which he delivered before the French Surgical Congress in 1895, said: "Resection of the lung for tubercular disease seems to me condemned past all appeal." This judgment may be somewhat too severe, and yet it probably expresses the view of most conservative surgeons on this subject.

The results of simple incision into tubercular cavities have been somewhat more favorable. A number of patients have been benefited by this procedure, and in certain cases this operation seems indicated. A successful termination must be exceptional, however, as the original focus of disease must still remain, and probably other foci also. Reclus reports eight such operations upon an equal number of patients, only two of whom died, while five were improved or cured. He states, however, that all were carefully selected cases. Laufert and Worth have calculated that out of 100 such cases, five die at once as the result of operation, ten die within a fortnight, fifteen more inside of a month, ten are improved, and zero represents the number of recoveries. Paget reports twenty-four operations, with nine deaths, five recoveries, and five improvements.

Operation for pyopneumothorax, as the result of tubercular ulceration, has been performed in a number of patients, in two of whom the opening was successfully closed by suture. The difficulty of locating the perforation must be great, however, and at best temporary relief only can be afforded.

The results of operation for growths in the lung are equally disappointing. When carcinoma or sarcoma occurs primarily the growth is in all probability so extensive before the diagnosis can be made that extirpation is impossible. In some cases where the malignant tumor has extended to the pleura and lung from the chest, it is possible that extirpation might be successfully accomplished.

In abscess, gangrene, and hydatid cysts, sufficient experience has accumulated to enable us to judge approximately of the risks of operation and of the chances of recovery. The results are becoming more and more favorable, and undoubtedly will be still more encouraging as soon as physicians can be convinced that operation is not attended with great risk, and that it offers a fair chance for recovery.

The results of operation for pulmonary abscess are certainly full of promise. Thus Fabricant reports thirty-eight cases, with twenty-nine recoveries and nine deaths. Reclus reports, out of twenty-three operations which have been performed within the past ten years, twenty cures and three deaths. The old idea that adhesions between the lung and parietal pleura were a requisite for successful operation is passing into oblivion. Adhesions are unquestionably of great advantage. When they exist the danger of infecting the pleural cavity and thus exciting pyopneumothorax is very slight, and the incision into the abscess cavity is a comparatively simple operation. Many successful operations have been performed, however,

where there are no such adhesions, as for example the cases recently reported by Smith and Frederick Treves in the *Lancet*, and by Northrup in the *New York Medical Journal*. If adhesions are absent the operations can be carried out in two stages: at the first, suturing the two pleural layers; at the second, opening the abscess after a delay of a few days. Unfortunately, however, such delay is generally inadmissible — it means death. The abscess must be opened at once. In certain cases the parietal pleura may be sutured to the lung, but generally the patient's condition is such that the operation must be rapidly completed, the pleural cavity being protected as well as possible by sponges and gauze.

In gangrene the mortality without operation is about eighty per cent. In certain cases of diffuse gangrene, operation is out of the question, and the case is hopeless. In circumscribed gangrene operation offers to the patient a fair chance of recovery. Excepting a few cases of gangrene occurring in young subjects, where the patch is small and near the apex, it is a question whether operation should not be advised as soon as the diagnosis is made in every case of circumscribed gangrene where the general state of the patient or some intercurrent disease does not render all treatment hopeless. As in abscess, so in gangrene; the operation, if otherwise indicated, should be performed, adhesions or no adhesions.

Another reason for delay which is sometimes advocated is that operation is not indicated until after the stage of consolidation has passed and deliquescence begun. The latter stage, however, is generally reached before the diagnosis has been made. Of course the patient may recover without operation, but the danger of sepsis, or the conversion of a circumscribed into a diffuse gangrene, more than counterbalances the risk of an operation. These risks are not very great, as may be judged from the statistics of Heydweiller, who collected forty cases treated by operation prior to 1892, with twenty-two recoveries, four improvements, and fourteen deaths. The more recent cases of Reclus number fourteen operations, eleven of the patients being cured, one being improved, and only two having died.

In cases of bronchiectasis the results of operation seem to be less hopeful. More than one cavity generally is present. One may be incised and healed, but others are left. Reclus reports twelve operations, eight of which terminated fatally, four of the patients being improved, but none cured. Paget reports five cases, all of whom were improved, but he adds that all were exceptional cases. The conclusion of Truc seems correct: "When the cavity in the lung is the essential lesion, when the symptoms of septic absorption dominate the scene, when there is high fever and the patient is shaken by cough and exhausted by profuse expectoration, then without raising vain hopes and simply to alleviate suffering we may have recourse to incision of the lung. Now and again a marked improvement has been noted."

The results of operation for hydatid cysts have been most satisfactory, indeed more so than for any other pulmonary affection. Paget has collected forty-five cases thus treated, thirty-seven of the patients being cured, and six having died. In this condition operative interference is always indicated. — *Medical News*, Feb. 13, 1897.

TOTAL HYSTERECTOMY AT TERM: CONTRACTED PELVIS.

PINARD and SEGOND treated a pregnant woman who was much deformed. There was scolio-kyphosis and asymmetrical pelvis; the anterior and posterior bony boundaries on the right side almost touched. It was agreed to let pregnancy go on to term and then to remove the uterus. On December 16, 1896, the operation was performed directly pains set in, term having been reached. A very free abdominal incision was made; then the uterus was pulled out, and immediately afterwards the upper part of the wound was closed by forceps applied to its edges so as to prevent prolapse of intestine. The elastic ligature was applied and the child extracted; it weighed ten pounds, and was living and strong. Then the placenta was extracted. Pressure forceps were applied to the edges of the wound in the uterus, and that organ was then amputated, with its appendages, by a continuous incision from left to right. On January 19 the patient was quite well. — *British Medical Journal*, Feb. 19, 1897.

PRIMARY SARCOMA OF THE SMALL INTESTINE.

MERMET records the case of a woman aged thirty-two, who came under observation with attacks of painful diarrhea, and a tumor below and to the left of the umbilicus, which

was thought to be a pyosalpinx adherent to the intestine. Laparotomy was performed, and the tumor was then found to involve the jejunum at one meter's distance from the duodenum. The portion of intestine was resected, but the patient died the next day. The growth was twenty cubic centimeters in length, and had sharp margins. The affected part of the gut was enlarged to the size of the transverse colon, its lumen also being increased in size. The mesenteric glands were enlarged. At the operation no other secondary growths were seen, but there was no necropsy. The growth was a small round-celled sarcoma, starting on the submucosa, and had infiltrated all the coats of the bowel. The author lays stress on the points of distinction between sarcoma and lymphadenoma of the intestine. Reference is made to twenty-three other cases of sarcoma of the small intestine. It occurs much oftener in males than in females; usually between thirty and forty years of age, while lymphadenoma occurs earlier. In eight out of fourteen cases recorded by Balzer the growth was a small round-celled sarcoma.—*British Medical Journal*, Feb. 6, 1897.

REPORT OF SIXTY-NINE CASES OF AMPUTATION AT THE HIP-JOINT BY THE WYETH METHOD.

JOHN A. WYETH (*Annals of Surgery*, vol. xxv, No. 2) records a death-rate of 13.9 per cent. in sixty-nine cases. The factors in the fatal cases were hemorrhage before operation, or shock. Of forty cases of sarcoma four died; of twenty-two cases of inflammatory bone disease three died. The efficiency of the method in controlling hemorrhage was demonstrated to be absolutely satisfactory in every instance but two. In one case the constriction was not tight enough; in another case the pins were not sufficiently strong.

Wyeth's method is as follows: The patient should be placed with the sacrum resting upon the corner of the operating table, the sound limb and arms being wrapped with cotton batting and thoroughly protected from unnecessary loss of heat. The limb to be amputated should be emptied of blood by elevation of the foot, and by the application of the Esmarch bandage, commencing at the toes. Under certain conditions the bandage can be only partially applied. When a tumor exists, or when septic infiltration is present, pressure should be exercised only to within five inches of the diseased portion for fear of driving the septic material into the vessels. After injuries with great destruction, crushing, or pulpefaction, one must generally trust to elevation, as the Esmarch bandage cannot always be applied. While the member is elevated and before the Esmarch bandage is removed the rubber-tubing constrictor is applied. The object of this constriction is the occlusion of every vessel above the level of the hip-joint, permitting the disarticulation to be completed and the vessels secured without hemorrhage and before the tourniquet is removed. To prevent any possibility of the tourniquet slipping employ two large steel needles or skewers, three-sixteenths of an inch in diameter and ten inches long, one of which is introduced one-fourth of an inch below the anterior superior spine of the ilium and slightly to the inner side of this prominence, and is made to traverse superficially for about three inches the muscles and fascia on the outer side of the hip, emerging on a level with the point of entrance. The point of the second needle is thrust through the skin and tendon of origin of the adductor longus muscle half an inch below the crotch, the point emerging an inch below the tuber ischii. The points should be shielded at once with cork to prevent injury to the hands of the operator. No vessels are endangered by these skewers. A mat or compress of sterile gauze, about two inches thick and four inches square, is laid over the femoral artery and vein as they cross the brim of the pelvis; over this a piece of strong white rubber tubing, half an inch in diameter when unstretched, and long enough when in position to go five or six times around the thigh, is now wound very tightly around and above the fixation needles and tied. If the Esmarch bandage has been employed, it is now removed. Excepting the small quantity of blood between the limit of the Esmarch bandage and the constricting tube the extremity is bloodless, and will remain so.

In the formation of the flaps the surgeon must be guided by the condition of the parts within the field of operation. When permissible, the following method seems ideal: About six inches below the tourniquet a circular incision is made down to the muscles, and this is joined by a longitudinal incision commencing at the tourniquet and passing over the trochanter major. A cuff that includes everything down to the muscle is dissected off to near the level of the trochanter minor. At about this level the remaining

soft parts, together with the vessels, are divided squarely down to the bone by a circular cut. At this stage of the operation the central ends of the divided superficial and deep femoral veins, as well as the arteries, are in plain view and should be tied with good-sized catgut. This done, the disarticulation is rapidly completed by lifting the muscular insertions from the trochanters and digital fossa, keeping very close to the bone with knife or scissors, and holding the soft parts away with retractors. The capsular ligament is now exposed and divided, and by forcible elevation, adduction and rotation of the femur, it is widely opened, the ligamentum teres ruptured, and the caput femoris dislocated. If properly conducted up to this point, not a drop of blood has escaped, excepting that which was in the limb below the constrictor when this was applied. The remaining vessels which require the ligature should now be sought for and secured. These are: the saphena vein, which on account of its proximity to the main trunk should be tied; the sciatic artery, which will be found near the stump of the sciatic nerve; the obturator, which is situated between the stump of the adductor brevis and magnus, usually about half-way from the centre of the shaft of the femur to the inner side of the thigh, the vessel being on a level with the anterior surface of the femur; the descending branches of the external circumflex, two or three in number, usually found about an inch and a half outward and downward from the main femoral vessels beneath the rectus and in the substance of the crureus and vastus externus. The descending branches of the internal circumflex are insignificant, and are usually found on the level of the femoral vessels in the substance of the adductor longus and between it and the adductor brevis and pectineus.

In tying the larger femoral vessels Wyeth makes it a rule to dissect both the superficial and deep femoral stumps back from one-half to three-fourths of an inch, so that he can apply the ligature behind any of their branches which may have been divided close to their points of origin, and does not hesitate to include the large veins in the same ligature in order to save time. With the vessels mentioned quickly secured, there is really no necessity for even temporarily loosening the tourniquet. If the operator is not sure that he has found and securely placed the ligatures upon these larger vessels, it is a simple matter to slowly loosen the grasp of the tourniquet until the pulsation of the larger trunks is perceptible. No attention should be paid to the general oozing from the large muscular surfaces which have been divided. If every oozing point were ligatured, from half an hour to an hour would be consumed in securing a dry wound in the majority of cases. In order to hasten the operation and stop the oozing, introduce a snug packing of sterile iodoform-gauze ribbon into the cavity of the acetabulum and the space between the muscles from which the bone has been removed, leaving one end of the ribbon to pass between the flaps for the purpose of its removal. With a long, half-curved Hagedorn-Fowler needle armed with good-sized catgut, deep sutures are passed through the stumps of the divided muscles in such a way that large masses of muscles are brought tightly together when these sutures are tied, taking two to four inches in the grasp of each suture. The needle is not passed in the proximity of the large vessels or the sciatic nerve, but in all other directions the muscles are rapidly quilted together. This effectively and rapidly controls all oozing. Nothing remains but to close the flap with silkworm-gut sutures, and cleanse it off thoroughly dry, seal it with collodion in its entire extent to prevent any infection from the genital or anal region, apply a large, loose dressing of iodoform and then sterile gauze, and a light bandage over the first light dressing. The pins are then removed and the remainder of the dressing completed. Preliminary pressure of the light dressing prevents oozing, and the wound remains dry.

MIDWIFERY AND DISEASES OF WOMEN.

E. Sava records the case of a multiparous woman pregnant at the eighth month, who was brought into hospital suffering from a round penetrating wound with irregular ecchymosed edges in the epigastric region. She had fallen on a sharp piece of wood which had caused the wound. The patient was conscious, her pulse was small and frequent, and the temperature subnormal. There were no signs that labor had set in, and the uterus was unwounded; but as there was evidently internal hemorrhage, laparotomy was performed. The source of the bleeding was found in a laceration of the epiploon; this was sutured, and the hemorrhage ceased. Some saline solution was left in the peritoneal cavity, as is done in cases of grave anemia, and the abdomen was closed in the usual

way. The woman left the hospital twenty days later, and soon afterwards she was delivered of a living, well developed child. She was seen by the author a month after the confinement, and she remained well. The case is interesting because the pregnancy, notwithstanding the triple traumatism (the fall, the puncture of the abdomen, and the laparotomy), went on uninterruptedly to the full term.—*British Medical Journal.*

THE TREATMENT OF CHRONIC BRONCHITIS.

In the *Revue de Thérapeutique Médico-Chirurgicale* of January 15, 1897, Dr. LYON contributes an article upon this frequent and often troublesome affection. He first points out that chronic bronchitis is nearly always a secondary condition following acute bronchitis or dependent upon organic disease such as emphysema, Bright's disease, or various cardiac affections. Acute bronchitis he thinks is very apt to become chronic in those persons who have a neuroarthritic tendency —or in other words those who possess a tendency to gout and allied affections. Sometimes, too, chronic bronchitis exists simultaneously with chronic disease of the nose and pharynx, and the relief of these lesions cures the bronchitis. Quoting Laennec as to the various forms of chronic bronchitis he divides them into the dry and moist form, the latter form in turn being divided into what is known as the mucous and purulent. Sometimes this purulent secretion becomes putrid, when it is known as "putrid bronchitis;" and finally there is, rarely, a membranous condition known as pseudo-membranous bronchitis. In association with these complications chronic tracheitis is sometimes present.

The treatment of bronchitis divides itself into several forms: first, the modification of the function of the bronchial mucous membrane so as to alter the secretion and also with the object of combating congestion; second, we must facilitate expectoration; third, we must calm the cough; fourth, we should improve the general health of the patient by hygienic and other measures. The agents which modify the bronchial secretion are numerous. The chief ones are those which after absorption are eliminated by the respiratory passages, and consist in greater part of the balsams, gum resins of plants containing essential oils, sulphur and its compounds, and the iodides. Of the first class of substances we may cite in particular tar, balsam of tolu, benzoin, turpentine and terpine, eucalyptol and creosote. The inconvenience associated with all these remedies is that they exercise an irritant influence upon the stomach. Copaiba, which is rarely employed because it has not a good reputation, nevertheless is very efficacious. Its essence is eliminated by the respiratory mucous membrane, and the resin is slowly eliminated by the kidney. Dujardin-Beaumetz recommended its association with tar. He prescribed four to eight capsules containing seven grains of equal parts of copaiba and tar.

Turpentine is usually employed in capsules holding three to four minims, six to eight of which are taken daily, but terpine has quite largely taken its place. The great difficulty with the administration of creosote in cases of bronchitis is the irritant influence which it exercises upon the stomach. There is no doubt, however, that creosote aids in getting rid of the secretion and acts deleteriously upon the tubercle bacillus. The balsams which have been mentioned are usually employed by inhalation, being added to hot water, and the steam arising therefrom inhaled.

The following prescriptions may be employed internally in using the medicines already suggested:

℞ Tar, 75 grains;
Balsam of tolu, 75 grains;
Benzoate of sodium, 1 drachm.
Make into 40 pills and give four a day.

℞ Terpinol, 2 grains;
Benzoate of sodium, 2 grains;
Sugar, sufficient quantity.
Make into one pill and give six to twelve a day.

℞ Terpine, 75 grains;
Glycerin and alcohol, 2½ ounces;
Simple syrup, 2½ ounces.
A dessertspoonful three or four times a day.

℞ Turpentine, 30 minims;
Tar, 30 minims;
Balsam of tolu, 1½ drachms;
Benzoate of sodium, a sufficient quantity.
Make into 80 pills and give six or eight a day.

℞ Terpine, 75 grains;
Brandy, 2½ ounces;
Syrup of lettuce,
Syrup of tolu, of each 3½ ounces.
One to two dessertspoonfuls twice or thrice a day.

Eucalyptol may be prescribed in capsules containing [illegible] grain; these may be given three or four times a day.

Lyon thinks that eucalyptol is preferable to turpentine, as it is not so apt to produce disturbances of the stomach and kidneys.

Benzoin may be given in the dose of half a drachm of the tincture several times a day with very good results; or the following may be used:

℞ Tincture of benzoin, 15 to 30 minims;
Tincture of canella, 2½ drachms;
Wine, 4 ounces.

In other cases it is wise to prescribe the following:

℞ Terpine and pure benzoic acid, of each 2 grains;
Codeine, ¼ grain.
Make into a pill and give four to six of these a day.

Or creosote may be given in pill form as follows:

℞ Creosote, 2 drachms;
Almond soap, a sufficient quantity.
Make into 80 pills and give eight or ten a day.

The pilular form of administration of this drug is very satisfactory, in direct contrast with the use of creosoted wines which have been employed in the treatment of pulmonary tuberculosis, with the result of very frequently provoking digestive disturbances. Because of the useful influence exercised by sulphur over the mucous membranes the various natural sulphur waters and also those which are made artificially may be employed. None of the natural waters are as good after transportation as they are at the spring. As sulphur tends to congest the bronchial mucous membrane it is only to be employed during the period of the decline of the bronchitis when the secretion resists the action of the balsams. The iodides are particularly efficacious in those cases in which the bronchitis is associated with emphysema, particularly if arterio-sclerosis is present. They liquefy secretions and aid in their expectoration from the lung. They have, however, the inconvenience attendant upon the administration of any iodide, namely, the loss of appetite and the other evidences of iodide intolerance. They must therefore be given with prudence. It is well to interrupt their administration every three or four days for a short period. The doses should vary from three to fifteen grains a day. It is advantageously associated with codeine or with belladonna. The following prescription may be used:

℞ Distilled water, 12 ounces;
Iodide of potassium, 3 to 8 drachms;
Fluid extract hyoscyamus,
Fluid extract belladonna, of each 1 fluidounce.

Dessertspoonful of this is to be taken at night before retiring, and again if dyspnea in nocturnal paroxysms appear.

[As these extracts are not entirely soluble in a watery menstruum this mixture will have to be shaken before it is used.—ED.]

Should the element of pulmonary congestion be marked, ipecac and ergotin in minute doses are often useful, and the ipecac may be combined with terpine and ergotin. As a rule, however, the ergotin is best administered in suppositories as follows:

℞ Ergotin, 5 grains;
Powdered opium, 1 to 2 grains;
Extract of hyoscyamus, 1-6 grain;
Cacao butter, a sufficient quantity.

This is to be made into a suppository and introduced each night into the rectum. If we desire to use ipecac the following may be given:

℞ Syrup of ipecac, ½ ounce;
Syrup of acacia,
Syrup of tolu, of each 4 ounces.

Two to four teaspoonfuls a day may be given in hot water.

So far as expectorant medication is concerned, we find that if the lung is exceedingly full of mucus it may be necessary to produce emesis by prescribing ipecac. Or if the patient is a strong, vigorous man we may prescribe tartar emetic in minute doses. In other cases the following prescription is useful:

℞ Chloride of ammonium, 45 grains;
Extract of hyoscyamus, 15 grains;
Powdered ipecac and powdered alum, of each 7 grains.

Make into fifty pills and give four a day.

Or the following powders may be given:

℞ Dover's powder,
Powdered squill, of each 10 to 20 grains;
Powdered eucalyptus, 1 drachm.

Make into thirty cachets and give three a day.

For the arrest of cough the same remedies are useful as may be employed in acute bronchitis, such as opium, belladonna, aconite, and cherry-laurel water. Where the secretion is thick the bromides are often very useful.

Hygienic treatment consists in the use of frictions and hydrotherapy, in sending the patient to a health resort, in the use of iodide of iron, cod-liver oil, bitters, and cinchona, and in the employment of arsenic and of cardiac stimulants such as digitalis and caffeine. Where there is a bronchorrhea full doses of ergot or hyoscyamus and of arsenic are of value, and for tracheitis inhalations of menthol vapor derived from a menthol in-

haler, or made by putting a few crystals of menthol in a hot spoon, are exceedingly useful.

For putrid bronchitis with fetid expectoration we should administer essence of turpentine, eucalyptus, carbolic acid, and creosote. Inhalations of oxygen are also valuable in such cases, and it is said that subcutaneous injections of eucalyptol made as follows are valuable:

℞ Eucalyptol, 5 drachms;
Liquid vaselin, 2 grains.
Inject one to two teaspoonfuls.

Lyon also quotes Da Costa as having recommended oil of sandalwood in doses of five drops four times a day.

In pseudo-membranous bronchitis we should treat the disease as we would diphtheria, by diphtheria antitoxin or antistreptococcic serum. Iodide of potassium may also be useful. In the chronic bronchitis of children, after being sure that no rickets, adenoid vegetations or hypertrophic rhinitis are the cause of the trouble, we should administer cod-liver oil, arsenic, and bitter tonics.

Reviews.

A Practical Treatise upon Diseases of the Skin. For Students and Practitioners. Fourth Revised Edition. By James Nevins Hyde, A.M., M.D., and Frank H. Montgomery, M.D.
Philadelphia: Lea Brothers & Company, 1897.

Any book dealing with general medicine, and therefore of interest to the all around practitioner, which runs through an edition in the period of three years may well be considered successful, and when we consider that this volume has reached its fourth edition in that period of time, although it deals solely with skin diseases, it will be understood at once that it must possess sterling merits which will recommend it not only to the dermatological specialist, but to the general practitioner as well. From the standpoint of the latter, we have looked over its pages for the purpose of discovering what the points were which have proved so attractive to many practitioners. One of these is the large number of illustrations which render the diagnostic points which are mentioned in the text clear to those who have not had the advantage of practical courses in dermatology; and second, there are many instances in which the recommendations as to treatment are fortified by the practical illustration of their method of application.

Archives of Clinical Skiagraphy. Edited by Sidney Roland, B.A.
London: The Rebman Publishing Company, 1896. Philadelphia: W. B. Saunders, 1897.

This, the last number of Volume I of the "Archives of Skiagraphy," contains a series of plates illustrating the anatomy of a double monster, the condition of the feet in a patient who had six toes, a fracture of the olecranon treated by suturing with wire, and similar subjects.

Such a journal must possess considerable interest to two classes of scientific investigators: first, those who are interested in the Roentgen rays from an electrical point of view; and second, those who are wont to employ these rays in the differentiation and diagnosis of disease.

Inebriety. Its Source, Prevention, and Cure. By Charles Follen Palmer.
Fleming H. Revell Company, New York, Chicago, and Toronto, 1897.

This is a small essay of just one hundred pages, closing with a curious diagram which seeks to illustrate the author's views in regard to the important subject which he discusses.

The first chapter is upon "Nervous Mental Organization," the second upon "The Inebriate's First Step Toward a Cure," and after two intervening chapters there is a final one upon "The Moral Characteristics and Various Types of the Inebriate."

Organ Diseases in Women. Notably Enlargements and Displacements of the Uterus and Sterility Considered as Curable by Medicines. By J. C. Burnett.
Philadelphia: Boericke & Tafel, 1897.

This is a little book of the style of a child's primer, devoted to the consideration of conditions of sufficient gravity to require a scientific treatise to consider them. As long as individuals are willing to resort to futile methods of treatment such as are recommended by Dr. Burnett, just so long will practitioners of the class he represents continue to exist. It is simply a case of supply equaling the demand.

We regret that this book should have been published. It is written by one professing to practice Homeopathy, who in no way represents the advanced and enlightened stand which some of those who profess to practice Homeopathy are now taking in regard to the methods which should be employed in the practical treatment of diseases, medicinal or operative. An ignorant midwife could have produced a more valuable contribution to medical literature.

THE MEDICAL ANNUAL AND PRACTITIONER'S INDEX. A Work of Reference for Medical Practitioners. Fifteenth year.
Bristol, England: John Wright & Company. New York: E. B. Treat. 1897.

The Medical Annual for 1897 contains 629 octavo pages which deal not only with therapeutic advances but also with the general topics of surgery, medicine, the various specialties in medical practice, and a description of new and valuable apparatus. It is, like previous editions of this well known reference book, copiously illustrated by pitctures which as a rule are quite up to if not beyond the quality usually found in the best medical text-books of the day. In the present volume colored Plate XIX showing various pathological conditions of the larynx and vocal chords, and Plate XXIII showing psoriasis, seem to us worthy of note. It is hardly necessary to add that the publishers have called to their aid the use of the skiagraph for the elucidation of the text where it was necessary. The English edition closes with a large number of pages devoted to the exhibition of new surgical and other apparatus, the names of various publishers, and a large number of advertisements of articles which will prove useful to the general practitioner. It is evident that a constant effort is being made by the publishers to maintain the reputation already acquired by this useful publication.

THE YEAR-BOOK OF TREATMENT FOR 1897. Prepared by many Collaborators.
Philadelphia: Lea Brothers & Company, 1897.

To those who are accustomed to looking forward to the yearly publication of this useful summary of therapeutic literature, we are confident that the present issue will give much satisfaction. It is now, as it has always been, a well prepared digest of therapeutic literature for the year, made by men exceedingly well fitted by experience for the responsible positions of abstractors. Each author knows full well exactly what is valuable and what must be cast aside as being useless to the general practitioner.

The paper, printing and binding are beyond reproach, and the cost of the volume is so moderate as to place it within reach of every physician.

DISEASES OF THE STOMACH. By Dr. C. A. Ewald. Translated and edited, with numerous additions, from the Third German Edition by Morris Manges, A.M., M.D. Second Revised Edition.
New York: D. Appleton & Company, 1897.

This classical book upon Diseases of the Stomach has not only proved itself very popular in Germany, but was translated in this country some years ago by Dr. Manges, and in England has been published in the list of the New Sydenham Society. The first American edition appeared in 1892 and speedily made for itself a place in American medical literature, first, because no similar book was to be had in the English language; and second, by reason of the fact that it was of itself a most valuable contribution to medical literature. Although the present edition is taken from the third German edition, which appeared in 1893, Dr. Manges has by careful editorial work included in the text, or in footnotes, everything in English and American literature which is of any value concerning the study of gastric disorders, so that the book is to-day not only a mirror of German study and practice, but also reflects the views of the best specialists upon this subject in this country.

We do not know of any other volume dealing with this or any other branch of medicine in which the references seem to be so well chosen and so judiciously quoted.

So much work has been done during the last four or five years in the study of gastric disorders in this country that we are practically the equals of our German brethren in the study of these lesions, and, perhaps because Americans are supposed to suffer from gastric disorders, have far surpassed our English cousins in this line of work.

Those who have the earlier edition of this book will, we are sure, hasten to purchase the new one, and those who have not the earlier edition certainly ought to enlighten themselves by having this one in their libraries.

CHIRURGIE DES VOIES URINAIRES. Etudes Cliniques par le Dr. E. Loumeau. 2mme Volume.
Bordeaux: Feret & Fils, 1897.

This work, like the one issued three years ago by the same author, is simply a close clinical study of disease as it occurred in the author's hospital and private practice. It appears in the form of case reports with practical comments. Many of these cases have already been published in current journals, but since they are properly classed under one branch of surgery the author believes it serviceable to collect them in a single volume. There is one case of paroxysmal hemoglobinuria studied with unusual care.

The first paper in the book is devoted to painful micturition of uterine origin, with reports of cases. Among interesting articles found in this volume may be mentioned a

well-illustrated paper upon Glandular Hypospadia; the description of an efficient hypogastric urinal; a discussion of the relation of urethral spasm to lithotrity; A Case of Vesical Papilloma; reports of Urethral Tumors; and Cancer of the Kidney.

This work should be valuable to those who are especially interested in genito-urinary surgery.

LECTURES ON APPENDICITIS AND NOTES ON OTHER SUBJECTS. By Robert T. Morris, A.M., M.D. Second Edition, revised and enlarged. With illustrations by Henry MacDonald, M.D.
New York: G. P. Putnam's Sons, 1897.

This collection of lectures, the author states, includes the substance of his teaching to the students at the Post-Graduate Medical School of New York, and also a series of notes on other subjects which have particularly interested his class.

The first chapter is devoted to preparation of the surgeon and patient and covers the general rules of surgical antisepsis. The second chapter is devoted to the anatomy of the appendix. Then follows a discussion on appendicitis, with surgical treatment and a table of cases.

The author's views on this subject are expressed in an unusually clear, original, and forceful manner. Following this portion of the book on appendicitis, there are a number of useful papers, exhibiting the author's ingenuity and success in dealing with unusual surgical conditions, and his keen observation of pathological processes.

The book is admirably printed and beautifully illustrated, and is worthy of the reputation of its distinguished author.

A PICTORIAL ATLAS OF SKIN DISEASES AND SYPHILITIC AFFECTIONS. In Photo-lithochromes from Models in the Museum of the Saint Louis Hospital, Paris. With Explanatory Woodcuts and Text. Edited by J. J. Pringle, M.B., F.R.C.P.
London: The Rebman Publishing Co., Ltd. Philadelphia: W. B. Saunders. 1897.

The photo-lithochromes of this admirable work, published by Saunders (Part VIII), and elucidated by Besnier, Fournier, Tenneson, Hallopeau, Du Castel, Feulard, Jacquet, and Pringle, are: Epithelioma Arising from a Lupus Scar; Erythema Iris. Erythema in Concentric Circles. Hydroic Erythema. Hydroa Vesiculeux of Bazin; Lichen Planus of Wilson, of the Papulo-Erythematous Variety; Biskra Button.

In addition there are several woodcuts. We have repeatedly endeavored to express how completely this work deserves the fullest praise.

Correspondence.

LONDON LETTER.

BY RAYMOND CRAWFURD, M.A., M.D.

We have now in our hands the Report of the Departmental Committee appointed by Lord George Hamilton in November last to inquire into the health of the British Army in India: its findings are simply appalling.

The main features of the Report may be summarized as follows: In 1889 a Cantonment Act was introduced into the Indian Army Service, which established a Lock Hospital system in dealing with venereal diseases. While the Cantonment Act was in force there was a marked decline in the amount of venereal disease, but since its abolition in 1893 there has again been a rapid increase, and this coincidently with a steady decrease in disease assignable to other causes. In 1895 the figures had reached their maximum, and showed an average of victims amounting to 522.3 men per 1000 strength. In the words of the Committee: "It is responsible for more than one-third of the total sickness, and the constant and complete disablement of 3200 men out of a force of 71,000, and a vast amount of partial disablement and invaliding under the head of many other complaints."

Out of the 5882 men detailed for field service with the Chitral Relief Force, close upon 12.5 per cent were found unfit for active service; and at this ratio 8800 men out of a total force of 71,000 would have to be put down as useless. The visit of the Committee to the Military Hospital at Netley, where soldiers invalided from India come under medical treatment, only served to fill in the details of this terrible picture. "In many cases," the Report runs, "recovery is hopeless, and what to do with them has become a question of serious difficulty: their friends refuse to receive them. Death alone can solve the difficulty and release them from their sufferings." Nor is this the end of the evil, for as these men return from India they are the means of importing a constant supply of venereal disease for dissemination at home. Surely it is strange that while we take no steps to prevent the inroad into our hearths and homes of a foul pestilence that by slow ravages eats up body and soul alike, we appoint commissions and hold conferences for keeping at bay a

disease which probably can never get foothold on our shores under existing sanitary conditions, and is at any rate merciful in the rapidity of its devastation. The Report further draws a comparison with the statistics of venereal disease in other European armies, where special regulations are in force. Thus the ratio per 1000 strength of men incapacitated is in the German Army 27.3; in the Russian, 43; in the French, 43.8; while in our own army it is 203.7 at home, and 438 in India. How to deal with this appalling catalogue of disease is the question with which we are now brought face to face. These figures do not serve to show any increase in sexual immorality, for on all hands it is agreed that with the better care bestowed on the British soldier in the last few years the actual standard of morality has been considerably raised. We have rather to deal with a vastly increased liability to disease; and while we are quite in sympathy with those who would strike at the root of the evil by educating the moral discipline of our soldiery, we are equally aware of the tardy nature of such a method of redress, and press for immediate measures to grapple with the evil before it gets out of hand. Our own wish would be to renew the Cantonment Act and enforce it rigorously, or if we must yield to fanatic morality, let us at any rate respect the dictates of reason and treat it as we treat other diseases that endanger the health of the community.

One of the most interesting features of this month has been a communication by Mr. Herbert Durham to the Royal Medico-Chirurgical Society of some experiments on peritoneal infections, which should possess an important clinical bearing on transperitoneal operations. These experiments were in continuance of similar work by the German bacteriologist Tsaeff in 1894 in connection with the cholera vibrio. Tsaeff showed that several different substances, when injected into the peritoneal cavity of guinea-pigs, were capable of affording protection to the animals, which were inoculated with cholera vibriones upon the following day. These preliminary injections raise "the power of resistance of the part," so that it can withstand a dose of microbes that would under normal conditions be fatal. About twenty-four hours is necessary for the development of this condition, and its duration is about four days. This heightened resisting power is quite distinct from specific immunity, for injections of indifferent substances produce the same conditions in a lower degree; then an injection of normal saline solution markedly increases the resistance of the animal to microbial agencies; also the immunity is of a more or less transient character, while specific immunity tends to be more abiding in its influence. The following table from Mr. Durham's experiments deserves careful study; the infecting agent was typhoid bacilli, the animals rabbits, and the preliminary doses of one cubic centimeter were given twenty-four hours before infection:

No.	Previous Treatment.	Infected with	Result.
1	None.	4 loops.	Death in under 17 hours.
2	None.	3 loops.	Death in 9 days 22 hours.
3	1 per cent. NaCl.	4 loops.	Recovered after illness.
4	Typhoid serum (horse).	6 loops.	Recovered: hardly ill.
5	Typhoid serum (horse).	9 loops.	Recovered: hardly ill.

This table serves also to emphasize the essential distinction between heightened physiological resistance and specific immunity. Similar experiments with the cholera vibrio and other bacteria gave similar results. This condition of increased bactericidal power of the peritoneal fluid is associated with the appearance in it of a number of active phagocytes of two kinds: (1) finely granular oxyphil or polynuclear leucocytes or microxycytes; (2) macrophages. As Mr. Durham remarks, the point of practical therapeutic importance is as to whether such preliminary injections into the human subject prior to operative interference with the peritoneum would similarly heighten the resisting power of the subject. Owing to the limited duration of the protection the method could never replace existing precautions against sepsis. Moreover a difficulty suggests itself in connection with the choice of injection, for the frequency of occurrence of any individual micro-organism is not so constant and invariable as to suggest the injection most likely on *a priori* grounds to have the greatest effect. The point to be aimed at is "to produce an ample leucocytosis in the peritoneal fluid, and also if possible to give a superadded specific protection by aseptic means." Statistics do however point to a relative frequency of streptococci in infective peritonitis,

and it might be desirable to employ antistreptococcic serum. In England much too great stress has been laid upon the importance of bacillus *coli communis* as the prime factor of infection in cases of intestinal origin. This is partly due to its vigorous growth obscuring the feebler growth of other micro-organisms, but also to the fact that some observers have used carbolized culture media, on which few microbes but bacillus *coli* are capable of growing; in fact the bacillus *coli*, though undoubtedly pathogenic in man, is probably one of the least virulent organisms present in septic peritonitis. Examination of the peritoneal fluid alone is quite insufficient in such cases, as this may be absolutely sterile, while the omentum and and other peritoneal membranes harbor innumerable microbes; and the search should be carried even further afield than this to the lymph-channels and glands connected with the peritoneum, and to the blood. The most important lymph-channels are those which pass up through the anterior mediastinum, and these should always be carefully examined in every case of peritonitis, as this is the path by which bacteria pass from the peritoneal cavity into the blood. In most cases of acute septic peritonitis there is a remarkable absence of signs in the peritoneal cavity, and unless a wider examination be made death from sepsis is likely to be attributed to shock. As a general rule, the least acute processes are those that manifest the most obvious signs in the peritoneum. If then we use antistreptococcic serum rather than one of the less efficacious indifferent injections, of which nucleinic acid seems to be the most active, we secure not only heightened resistance, but specific immunity as well in the great majority of cases. The fact that the omentum is so prone to harbor micro-organisms has an important bearing on the method of flushing the peritoneal cavity in cases of suppurative peritonitis. To quote Mr. Durham's own words: "In the laboratory and in the post-mortem room it is found that the majority of organisms and exudation cells are found about the omentum, the surfaces of the liver, spleen, and diaphragm—in fact the upper part of the peritoneum. It seems clear therefore that in cleansing the abdominal cavity especial attention should be paid to thoroughly mopping out and washing these parts—the omentum, and between the liver and diaphragm," not however to the exclusion of other parts. Intestinal peristalsis by the vermicular movements seems to be the mechanism which determines deposit on the omentum; here they are brought into intimate contact with the leucocytes that transude chiefly from the mesenteric vessels. From this Mr. Durham draws an argument in favor of laxatives in septic peritonitis, for by such means peristalsis is re-established, and the increased circulation in the mesenteric vessels favors increased local leucocytosis. We have dealt very fully with Mr. Durham's paper, as the suggestions it contains are so well worthy of close attention and further investigation.

Mr. Clement Lucas's indictment of anesthetic apparatus as a purveyor of disease has at any rate been fruitful in stimulating criticism. We ourselves are rather of opinion that Mr. Lucas has grappled with a phantom in maintaining that the pulmonary sequelæ of operation are to be attributed to infection and not to the anesthetic. It has been generally held that the presence of the pneumococcus in the lung is not in itself sufficient to cause pneumonia, but that some factor lowering the physiological resisting power of the part is necessary for the effectual activity of the micro-organism. The pneumococcus has been shown to be present in the sputum and in the discharges from the respiratory passages of a very large number of persons in health. In operations this factor is almost beyond reasonable doubt the anesthetic. So it is that pneumonia is much more frequent after inhaling ether and chloroform than nitrous oxide, because the last named is much less irritating to the lung. In all probability the apparatus has no calculable influence in its production, for nitrous oxide, which necessitates the most elaborate paraphernalia, is seldom or never followed by pneumonia, while the same cannot be said of chloroform, which is usually administered on a receiver saturated with the drug; and in this connection it should be remembered that chloroform is a powerful antiseptic, while nitrous oxide is a relatively powerless bactericide. Still, while even an infinitesimal opening for infection exists, it is of something more than mere academic importance to forestall this possibility. With this end in view Dr. Silk of London has introduced celluloid and metal inhalers, which can be submitted to all the same processes of sterilization as are applied to other instruments used at operations; or, as suggested by Mr. Lucas, toughened glass might be employed for the same purpose, and an asbestos web that could be raised to a white heat substituted for the flannel or sponge receiver.

PARIS LETTER.

By A. R. Turner, M.D. (Paris).

At a dinner given some days ago by the Society of Hygiene of France, one of those called upon to speak was Dr. C. E. Sajous, of Philadelphia, who referred to a remark made not long ago during a discussion in the Chamber of Deputies on the practice of medicine in France by foreigners. One of the deputies, Mr. Georges Berry, had said that it was a well known fact that in Philadelphia any one could purchase a diploma. Dr. Sajous recalled the case which had been the ground of such erroneous statements, namely, that a certain Buchanan, having by fraud obtained possession of a charter, had sold so-called diplomas to foreigners in some instances. This man, prosecuted by the Philadelphia County Medical Society, had been arrested and sentenced to a term of years in prison, served his term, and had already been dead some years. Though the prosecution occurred some seventeen years ago, Dr. Sajous expressed his astonishment to find that it had not as yet reached foreign ears.

Dr. Sajous also spoke of the numerous institutions of learning to be found in Philadelphia and the United States in general, and expressed his belief that taken all in all they could favorably compare with the majority of European institutions. It was greatly to be regretted, he thought, that the United States should be so unjustly criticized, and he sincerely hoped that the statement made by him would be sufficient to modify the false impression under which foreign physicians were laboring.

The physicians present, many of whom are very prominent, expressed their hearty approval of Dr. Sajous' statements on behalf of his country's institutions, and stated that all present would do all in their power to counteract the false ideas existing on the subject among the profession of the Continent.

In "Les Misérables," by Victor Hugo, the author speaks of Louis Philippe, who reigned in France from 1830 to 1848, as "the first King who ever shed blood to save life." These words refer to an incident in Louis Philippe's life of which the Duke of Aumale, his son, recently spoke. The King in 1833 went out with his entire family to meet his son-in-law, the King of Belgium, who was coming to Paris. An old courier who accompanied them was thrown from his horse and injured. The King called for some one to bleed the man (we must remember the medical theories of the early part of this century), and as no one offered to do so, himself opened a lancet which he had with him, tore up some handkerchiefs, and bled him. This lancet, according to the Duke of Aumale, his father had retained from the period when he had acted as Dresser in the Hôtel-Dieu of Paris.

The Duke of Aumale stated that he could remember seeing a painting made at the King's order in which the latter was shown in the white apron worn by the dressers, and accompanying the head of a medical or surgical service in the visit to one of the wards of the Hôtel-Dieu of Paris.

On Saturday, March 24, there died at Havre a physician—Dr. de Bossy—who for many years had been the oldest medical man in France, and perhaps of the entire world. He had just finished his 104th year. He was born in Paris in 1793, was taken to England, where his youth was passed and where he pursued his medical studies. After obtaining his diploma he sailed for India, where he practiced ten years, and later on in the Mauritius. In 1843 he returned to France, passed his Doctor's Thesis at the Faculty of Medicine of Montpellier, and settled in Havre, where he practiced as long as he lived, for until the very end Dr. de Bossy continued to receive patients and to make visits. A celebration was given four years ago by his colleagues in honor of his 100th year. Dr. de Bossy's father lived to an even greater age—108 years.

Recently Dr. Dieulafoy has described in various communications made to the Academy of Medicine and other societies, an affection to which he has given the name of Intestinal Lithiasis. This affection, which may be found in patients of all ages, consists in the expulsion by the anus of sand or even of concretions of larger size. Almost always it is associated with muco-membranous colitis. The sand is in some cases voided without pain by the patient, who may even not know of the existence of the phenomenon, until by chance he discovers it. In other cases severe attacks occur, during which colic, nausea, and even vomiting, similar to the symptoms of hepatic colic, are present.

It is probable that this intestinal lithiasis is allied to the gouty diathesis.

In one case analysis of the sand gave the following results: Fatty substance, 28.50 per cent.; calcium phosphate, ammonio-magnesium phosphate, and calcium carbonate, 16 per cent.; chloride, traces; animal substance and organic matter, 55.50 per cent.

As the proportions vary, the sand and gravel found in various cases may differ in color, friability, and hardness. Dr. Dieulafoy calls especial attention to the fact that as yet he has seen no case of appendicitis connected with this affection.

The treatment recommended is the same as that in biliary lithiasis.

In France baldness, and especially premature baldness, has been considered one of the symptoms of the arthritic diathesis. In a recent series of researches Dr. R. Sabouraud proves, to use his own words, that it is "one of the most extraordinary and purely microbian affections to be met with." Dr. Sabouraud, who for several years has been connected with the St. Louis Hospital, the great dermatological hospital of Paris, and who is at the head of the Laboratory connected with the service of Dr. Fournier, is the same whose researches on the parasite of trichophytosis are now universally known.

Ordinary baldness is due to a specific microbe which invades the hair follicles. This microbe he has succeeded in cultivating. Its action on the hair follicle may be summed up as follows: It first gives rise to hypersecretion of sebum followed by hypertrophy of the sebaceous glands annexed to the hair; this in turn causes progressive papillary atrophy, and finally the death of the hair. In other regions where excessive seborrhea exists, the skin is hairless, and treatment of seborrhea of such regions will tend to produce a growth of hair in places where previously none existed.

A CASE OF ACETANILID POISONING.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: The following case of poisoning by acetanilid seems to me of interest. A married woman, aged twenty-one years, just two weeks after her confinement suffered from quite severe frontal headache and was given by a physician half an ounce of acetanilid in bulk in an envelope, with directions to take a small quantity of it on the end of a teaspoon every two hours. The patient took two doses as directed, and a few hours afterward, the headache still persisting, she concluded that a very large dose would be more efficacious, and swallowed a teaspoonful of the drug. Half an hour afterwards she began to grow weak and to feel dizzy, and an hour later she fainted and passed urine involuntarily. Her husband then consulted a book on Homeopathic Home Remedies, but failed to give her any relief.

She became cyanotic, and the husband becoming greatly alarmed sought for the nearest physician. I reached the case at 7 P.M. and found her in a semi-conscious condition. The pulse was slow and extremely feeble, the respirations slow and shallow, the forehead bathed in sweat, the face livid and perfectly expressionless. The tongue, lips and fingernails were intensely cyanotic and almost black; the head, hands and eyelids were cold, but her feet were quite warm; temperature was normal; there was tingling of the skin over the entire body and some slight mental confusion. Some headache still persisted. There was suppression of urine until noon the next day, and when passed it was of a dark brown color and very abundant. I also noticed a loud and continuous borborygmus. The milk secreted by the breast was very much thinner than it had been before the poisoning. The cyanosis lasted for several days.

The treatment was essentially that advised by Professor Hare. The patient was forced to maintain a recumbent position, the head was kept low, and a hypodermic injection of aromatic spirit of ammonia followed by sulphate of strychnine and sulphate of atropine were given. Hot bottles were placed about the body, and she received $\frac{1}{60}$ of a grain of strychnine every three hours by the mouth, alternating with whiskey and aromatic spirit of ammonia. Owing to the condition of the milk it was not considered wise for the patient to continue nursing her child, as the milk failed to return to its normal condition after recovery, and the patient was much exhausted.

Yours truly,

G. BARINGER SLIFER, M.D.

PHILADELPHIA.

TAKA-DIASTASE.

To the Editor of the THERAPEUTIC GAZETTE.

In the course of recent experiments I was accidentally led to find that Taka-Diastase is a very active peptonizing agent, being especially vigorous when brought in contact with the caseine of milk.

Having neither the time nor the facilities to pursue the matter further, I bring it to your attention, hoping that a careful investigation will be instituted.

So far as I know this is the first time that such a property has ever been attributed to a diastatic ferment.

Very truly yours,

J. B. RUSSELL.

NEW YORK.